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ABSTRACT

This symposium was designed to promote the formation of an instructional system that would incorporate the best instructional methodologies. Four papers were presented, each dealing with an acknowledged approach to teaching. The first paper emphasizes the importance of effective curriculum design, a facet of direct instruction that assists teachers, through the use of explicit frameworks and specific instructional examples, in making connections for students. The second paper presents aspects of 4MAT, a system that assists educators in designing instruction that focuses on all four learning styles. Brain dominance differences are discussed. In the third paper, a model for invitational education is presented, emphasizing the collaborative and cooperative processes in developing a school climate in which learning can be enhanced. The fourth paper explores connections between the need to develop the thinking skills of all students and each of the four instructional approaches, including cooperative learning, direct instruction, invitational education, and learning styles. Graphic notes, "mind maps", accompany the papers to facilitate an organizing schema. Results of evaluations of the symposium follow the presenters' papers, along with an epilogue written by a participant. The symposium agenda and biographical information on the presenters is appended. (JD)

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Occasional Paper Series

Making Connections: Four Educational Perspectives

Edited by Maryrita G. Miller

AEL Occasional Paper 29

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Making Connections: Four Educational Perspectives

Edited by
Maryrita G. Miller

May 1989

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Center for Cognitive Teaching
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Yvonne Thayer, Director
Professional Development
Radford City Schools

Introduction

IN 1983, David Berliner* set out to discover what professional positions in business and industry most closely paralleled that of the public school teacher. He analyzed what various positions required in terms of professional knowledge, information processing, decisionmaking, and action. Berliner discovered that the position most closely resembling classroom teacher was that of business executive. That comparison seems even more valid today—especially in terms of professional knowledge and information processing.

Information processing technology seems to be burying educators and executives alike. Both seem to be looking through their respective professional networks for the right combination of human, print, and electronic inputs that will keep them abreast of new knowledge from researchers, policymakers, and fellow practitioners. To help people cope with the information overload, the media offers instant analysis and synthesis—in *new* publications, *new* computerized information banks, and *new* video- and audiotape series.

All of us at the Radford University Center for Cognitive Teaching are sensitive to the information overload that confronts teachers. We understand the frustration of central office personnel charged with disseminating the most appropriate findings of researchers—the most useful information concerning teaching and learning. So, about two years ago, we began discussing how we at the Center could "cut through" some of the different approaches/methodologies in our field of cognitive science. How could we package some of the things we are learning in a way teachers and in-service providers would find useful?

One solution to this dilemma would be to bring together credible advocates of the most prominent approaches to instruction with an aim toward integrating proven methodologies.

A letter was sent to superintendents and other selected instructional leaders in Virginia to determine interest in such an effort. Responses from more than 80 of Virginia's 130 school divisions indicated keen interest. The following statements from three respondents demonstrated a high level of concern.

- *I propose as Objective No. 1 that you get four of the nationally recognized proponents of four of the dominant methodologies to extract from their storehouses of knowledge a "comprehensive holistic instructional system." The fallout should be quite beneficial. You are on the right track.*
- *The need to synthesize not only methodologies but learning into a holistic structure has never been more critical than it is now with the information "explosion" within our profession.*

*Berliner, D. (1983). The executive functions of teaching. *Instructor, 93*(2), pp. 28-40.

- *The cognitive and affective domains which influence not only teaching but learning must be addressed together.*

The Appalachia Educational Laboratory (AEL) offered to help in the effort. The mission of the Lab is to work with educators in an ongoing research and development-based effort to improve education and educational opportunity in a four-state Region: Virginia, Tennessee, West Virginia, and Kentucky. It was decided that the symposium would be in Roanoke, Virginia, and that invitations would be sent to educational leaders in the four-state Region. AEL would monitor the proceedings and develop a monograph.

The symposium was designed to promote the formation of an instructional system that would incorporate the best of what we know about teaching and learning. One concern was that making connections between and among various instructional approaches/methods demanded a departure from the traditional format of most conferences. Consequently, experts were asked to present information in joint sessions. They were challenged to make connections in order to help teachers see how the methods of one expert "fit" with another.

The symposium format encouraged dialogue and discussion, not only between and among the presenters, but also with the participants. (See Appendix A for a condensed agenda.) Selected educators participated in a panel discussion midway through the symposium. Panel members posed questions designed to elicit thought and discussion about ways we could achieve a deeper level of understanding and synthesis of the various instructional models.

We wanted participants to become intellectually engaged. Taking into account information processing theory, we invited experienced visual notetakers for the joint presentations. They took, and displayed as they created them, graphic notes as the presenters "made connections." These "mindmaps," as they were called, made visible the invisible and facilitated the development of an organizing schema. Mindmapping and the roles of the visual notetakers are described in the section following this introduction.

The four presenters (brief biographies are included in Appendix B) were asked to prepare papers in which they looked for and noted connections among the four methodologies. Presenters responded by requesting articles or papers that would inform a presenter of the others' work, i.e., basic principles or assumptions of the other presenters' positions. It is possible that each came to the symposium with some notion of how connections might be made—and perhaps ought to be made. Yet, it was during the presenters' interactions with each other throughout the two days that connections ultimately were made. It was most interesting to watch this occur. Initially, presenters had been centered, totally committed to their approach or method. Before interacting, they probably had not clearly understood that the interrelationships were viable and, indeed, would enhance and expand a teacher's ability to make good decisions in the classroom.

Papers written by each of the presenters are included in this document, with mindmaps included as appropriate. Evaluation results follow the presenters' papers. A final section, "Reflections on Beginning the Synthesis," was prepared by Yvonne Thayer, director of Professional Development, Radford City Schools.

Educators must begin the synthesis referred to by Thayer and others. Integrating newly learned techniques into one's existing "teaching sche-

mata" follows the process of exploring and discussing the techniques and methodologies with other educators. Presenter Jay McTighe points out in his paper the importance of that process in the "construction of a personal synthesis which is meaningful and *accessible* [emphasis added] to the individual."

Teachers are eager to acquire information and skills that will help them to facilitate learning, to create pleasant and fruitful learning environments, and to make good decisions in their classrooms. It is hoped that *Making Connections*—the symposium, this document*, and the videotapes housed at the Radford University library—will prove to be effective resources for teachers and administrators.

Dr. Beth Nelson
Radford University

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Mindmapping

This section describes mindmapping and the roles of the visual notetakers who developed the mindmaps at the symposium. A visual notetaker was present at each joint session of the symposium.

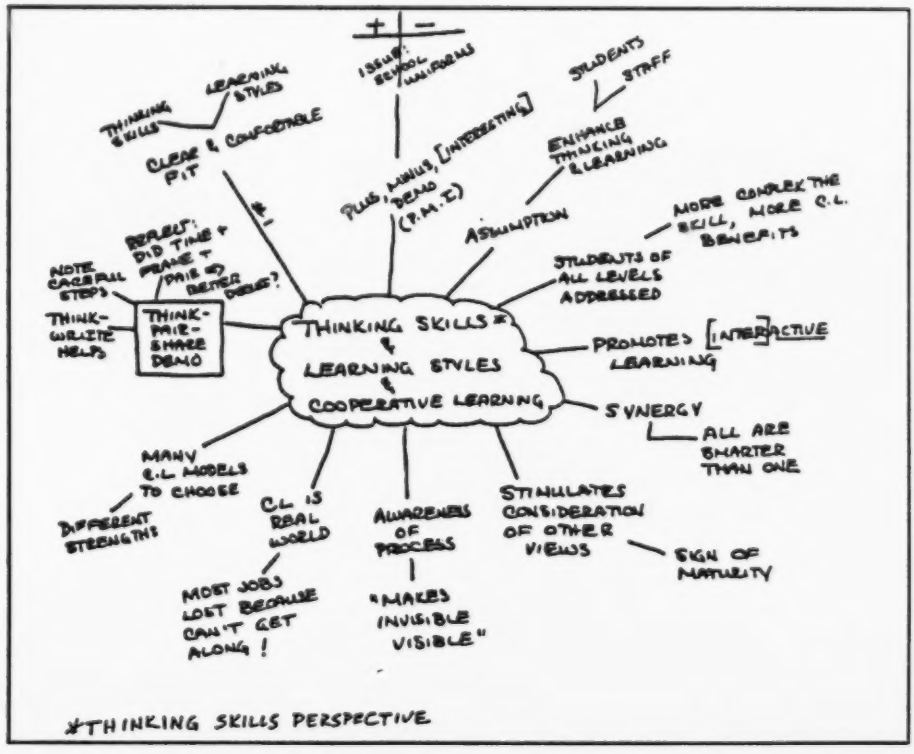
Description of Mindmapping and Its Advantages

Mindmapping is a technique for recording ideas on paper and portraying a global picture ("cognitive map") of concepts being discussed. Mindmapping captures concepts in the same way the brain does, and its use promotes creative thinking and connection-making. At the symposium, visual notetakers were present at each joint session in an effort to find connections between the two methodologies being discussed.

It was felt that seeing a representation on paper—a mindmap—of what presenters were saying could help symposium attendees (and perhaps presenters) make connections. Not only could attendees hear what the presenters were saying, but attendees could also see a visual representation (mindmap) emphasizing the thrust of presenters' remarks.

A sample mindmap is presented here. This sample was taken from the discussion between Susan Morris Leflar and Jay McTighe on cooperative learning. Other mindmaps developed at the symposium appear within the text of the four presenters' papers as appropriate, with the hope that the mindmaps again will serve as an aid to the reader in making connections.

Several advantages of a mindmap include its use as a tool for visual recording, promoting creativity, and encouraging innovation. As a tool for visual recording, mindmaps helped symposium attendees "see" what presenters were saying. The mindmaps also provided feedback to pre-



senters concerning what one listener, the visual notetaker, was hearing. As readers read presenters' papers (with mindmaps distributed throughout the text as appropriate), the mindmap's use as a visual record will become evident. In promoting creativity and encouraging innovation, mindmaps uncovered new patterns in some instances and captured components that might have been overlooked in other instances. According to attendee feedback, however, the chief benefit of the mindmap at the symposium was to maintain the focus of the ongoing joint discussions.

Additional Roles of the Visual Notetakers

At this symposium, mindmapping was one of several roles of the visual notetakers. The two persons who developed the mindmaps were introduced to symposium attendees as "visual notetakers," and that label aptly describes their primary function, described above as mindmapping. However, the visual notetakers served in at least two other capacities.

A second function of the visual notetakers was to involve attendees periodically in cooperative learning activities. This strategy seemed particularly appropriate since cooperative learning was the focus of several discussions. In addition, the cooperative learning activities frequently emphasized connections as well as plans for implementation of symposium ideas.

Another role of the visual notetakers at the symposium was to focus attendee attention on goals. At the beginning of the symposium, notetakers asked attendees to list their goals in a "goals web," which emphasized relationships or connections among goals. Construction of the goals web focused attendees on the reasons they had come to the symposium. At subsequent sessions, visual notetakers asked attendees to review progress toward goals. Periodic review of goals promoted a sense of ownership—a need for attendees to honor their reasons for attending and to learn what they had come to learn. This thoughtful attention to goals was one of many methods used throughout the symposium to focus presenters and attendees on the need to actively look for connections.

The following section includes the papers of each of the four presenters. In varying degrees, they responded to the request to look for connections among methodologies.

The Papers

Connections: Direct Instruction

Douglas Carnine
University of Oregon

Direct Instruction is a comprehensive instructional system with many components. These include curriculum design, teacher expectations for student learning, teaching skills, the amount of time students spend on task, procedures for monitoring student learning, staff development, administrative support, and parental involvement. Emphasized in this paper is the importance of effective curriculum design, a facet of Direct Instruction that assists teachers—through the use of explicit frameworks and specific instructional examples—in making connections for students. Finally, the author examines the critical role of teacher expectations for student learning within the framework of the Direct Instruction model and the resultant implications for at-risk students.

AS LEE SHULMAN recently noted in his "Conversations from Wingspread" on PBS:

> It is clear that the "nuts and bolts" approach is not enough [for teachers]: managing a classroom, handling discipline, using the bulletin board, working with the principal. All those things are important, but at least as important is the ability to take the content they're teaching and find the examples, the analogies, the demonstrations, the metaphors, and the comparisons that will bring alive what is otherwise dead material. That is something you cannot do without having a very deep and rich understanding of teaching methods.

These examples, demonstrations, and metaphors must do more than bring life to the material; they must also bring clarity. This clarity comes from effective curriculum design, the complement of effective teaching. Clarity though, like beauty, is in the eye of the beholder. What a teacher views as a clear demonstration might be seen quite differently by some students. For example, even after teachers demonstrate how to regroup numbers, many students continue to make errors such as this one:

$$\begin{array}{r} 74 \\ -\,15 \\ \hline 61 \end{array}$$

The students still take 4 from 5 and 1 from 7. In making this error, students are indicating that the demonstration wasn't as clear, or at least as compelling, as the teacher intended. The reason is that teachers often overlook what the students bring to instruction.

When first learning to compute in problems such as 23 + 14, students can add 3 and 4 or 4 and 3; order doesn't matter. Moving on to early subtraction problems, students always subtract the smaller number from the larger, as in 98 - 56. Later, after listening to the teacher's explanation of regrouping, many students perform according to their more familiar knowledge; it doesn't matter which number is on top because the smaller number can always be subtracted from

the larger. Applying these rules to 74 - 15, students subtract 4 from 5 and 1 from 7. Their answer is 61!

Similarly, a sixth-grader's strategy for solving word problems is based on what she figured out in school. "If there is lots of numbers, I add. If there are only two numbers with lots of parts, I subtract. But if there is just two numbers, and one a little harder than the other, then it is a hard problem, so I divide if they come out even, but if they don't, I multiply."

What can be concluded from these examples? First, students are *always* active learners, hypothesis generators. Second, their hypotheses are shaped by direct experience more than by the students' unique attributes or by the intentions of the teacher. Thus, the intelligent selection of examples, demonstrations, and metaphors requires an understanding of how they might shape the hypotheses students form.

...clarity comes from effective curriculum design, the complement of effective teaching.

By anticipating students' erroneous hypotheses and the corresponding mistakes, educators can devise activities that will reduce the likelihood of those mistakes, in effect structuring the instructional environment to constrain their hypotheses. Viewing instruction within a continually changing context, rather than as a series of isolated, unrelated skills, prompts educators to prevent the formation of hypotheses that are unintended by the teacher but reasonable in the eyes of the students.

In preparing students to regroup, for example, the instructional designer might present a series of simple problems, such as:

1	7	5	2
-7	-1	-2	-5

Students would be told they had to subtract the bottom number from the top number. The students would then cross out problems they couldn't work and write the answers to the problems they could work. This activity sensitizes students to the consequence of having the smaller number on top.

One more example is included below.

```
  1
 26
+48
 64
```

Analyzing the students' earlier math instruction helps one to understand the origin of the error. The fundamental goal in the primary grades is teaching reading, a left to right activity. In simple computation problems, working from left to right does not lead to a mistake:

23	23	23
+42 →	+42 →	+42
	6	65

In marking a student's paper, the teacher would treat the response as correct, unintentionally reinforcing the student's misconception. Students can practice computing from left to right for several weeks, getting correct answers every time! But look what happens with more complex regrouping problems:

		1
26	26	26
+48 →	+48 →	+48
	6	64

To prevent this misconception, the teacher would first model working problems from right to left, then monitor the students as they work, to make sure they also work from right to left.

Explicit Frameworks

During the past 20 years, researchers at the University of Oregon

have published over 50 studies demonstrating the effectiveness of curriculum design principles that anticipate and prevent common student misconceptions (e.g., Engelmann & Carnine, 1982). A major finding was the importance of providing students with an explicit framework or schema to help them organize their learning and to preclude misconceptions. This framework can take the form of a multistep procedure, a unifying principle, or a rule.

Multistep procedure. A multistep procedure can be illustrated with logical reasoning, which along with analogical reasoning, covers Aristotle's two aspects of reasoning. Research findings on teaching logical reasoning, e.g., DeLeeuw (1983) and Lane, Fletcher, and Fletcher (1983), engender little confidence in conventional curriculum design of multistep procedures for teaching reasoning. Consequently, Engelmann and Carnine's Direct Instruction analysis (1982) will serve as an example. The multistep procedure was much easier for students to comprehend than those developed in earlier research studies, in part because it was not designed to handle all forms of conclusions. Even with the simplified procedure, three completely new versions of a Direct Instruction computer-assisted instruction (CAI) program had to be written before students were able to surmount typical hurdles, e.g., learn to critique arguments as well as they could draw conclusions (Collins, Carnine, & Gersten, 1987; Collins & Carnine, 1988; Grossen, 1988).

The multistep procedure can be illustrated using a diagram and these statements of evidence:

All S are G.
No B are G.

For the first statement of evidence, students draw:

All members of the class S are inside the class G. The second statement also contains the class G, so the diagram requires a second G. According to the second statement no members of B are G, so all B's are outside G:

When students draw a conclusion, they learn to include S and B, but not the twice-named class, G, resulting in this diagram: [S] [B]. Neither class, S or B, includes the other, so the conclusion cannot begin with *all*. The classes do not overlap, so the conclusion cannot begin with *some*. The classes don't make contact in any way, so the conclusion begins with *no*.

...over 50 studies [demonstrate] the effectiveness of curriculum design principles that... [provide] students with an explicit framework or schema to help them organize their learning and to preclude misconceptions.

Unifying principle. Another form of explicit framework is a unifying principle. The purpose of identifying unifying principles is particularly important in science and social science where students are inundated with a great number of seemingly unrelated facts and concepts. By one estimate, students would need to learn, on the average, a new biology concept every two minutes to cover the content of a high school biology textbook. A typical biology textbook introduces twice as many new concepts as the American Foreign Language Association recommends introducing new labels for

familiar concepts. Most students try to remember some of the vocabulary, at least until they take the next test.

One way of handling this information overload and the attendant misconceptions about the nature of science is to first identify underlying principles of a discipline. The concepts necessary to understand the underlying principles can be taught, followed by instruction on the unifying principles themselves. Finally, the concepts that can be explained by the underlying principles are presented. Later, time can be spent teaching the important remaining facts that do not relate to the underlying principles.

Educators are becoming increasingly cognizant of their responsibility to bring both life and clarity to their instruction through demonstrations, examples, and metaphors.

For example, earth science covers a wide variety of phenomena in the solid earth, oceans, and atmosphere. Yet textbooks do not emphasize the underlying principle of convection. To understand convection—the circular motion of a substance in a medium—requires knowledge of many prerequisite concepts: heating and cooling and the implications for expanding and contracting, which lead to rising and sinking, and finally, high and low pressure areas. Students first must learn these prerequisite concepts to understand convection. Convection then serves as the underlying principle for many of the natural phenomena—earthquakes, granite mountains, volcanoes, ocean currents, and air currents—found in the earth, oceans, and atmosphere. These phenomena are not unrelated facts, but part of a lawful, comprehensible system.

Rules. The final form of an explicit framework involves rules and how to make inferences based on those rules (Carnine, Kameenui, & Woolfson, 1982). Some rules (e.g., the identity element for multiplication—multiplying a number by a fraction equal to 1 does not change the value of the number) are crucial to understanding why certain actions are permissible (e.g., rewriting fractions with a new denominator). When students determine that 15 is the lowest common denominator for 2/3 + 1/15, they must rewrite the first fraction: 2/3 (—) = _/15.

Three times 5 equals 15, so the denominator of the fraction in the parentheses must be 5:

2/3 (_/5) = _/15.

Based on the identity element for multiplication rule described earlier, students then infer that the numerator of the fraction in the parentheses must be 5:

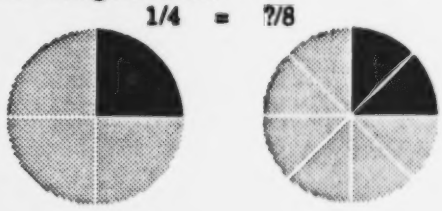
2/3 (5/5) = _/15.

Five over 5 equals 1, which is the only value that can be multiplied and not destroy the equality relationship. Students then complete the rewriting process:

2/3 (5/5) = 10/15.

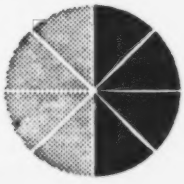
Textbooks often substitute "meaningful instruction" for explicit frameworks. For example, basal textbooks attempt to make new concepts meaningful by beginning with semiconcrete representations, such as this one for rewriting fractions:

1/4 = ?/8



The pictures are assumed to develop the concept that 1/4 can also be written as 2/8, since the same area is shaded in both fractions. The problem is that many students figure their answer by counting the shaded parts, ignoring everything else. This can be easily demonstrated by giving students a problem like this one, which does not even require looking at the equivalent fraction on the left side of the equal sign.

= ?/



Students can respond correctly by counting the four shaded parts. They have formed the misconception that all they do is count the shaded parts. The consequence of this misconception arises later when the students are asked to solve a problem such as: 2/3 = ?/6. The students have no shaded parts to count. High-performing students may draw a picture or visualize the answer. On the other hand, low-performing students need an explicit multistep procedure including rules such as the one given earlier—when multiplying a number by a fraction equal to one, the value of the number is not changed.

Teaching With Examples

Even when a multistep procedure, underlying principle, or rule is taught, specific instructional examples must be selected and sequenced. In fact, most teaching of young children and low-functioning students can be done only with examples. For example, concepts such as *red*, *b*, *longer*, or *hot* cannot be taught with definitions.

B-d reversals illustrate how students can develop misconceptions when learning through examples. Students first encounter *b* and *d* in kindergarten or first grade. They know that the name of an object does not change when its orientation is changed. For example, when a chair is flipped to face the opposite direction, it is still a chair. Yet, when a *b* is flipped to face the opposite direction, it becomes a *d*! Extensive research has shown that objects and symbols that are visually and auditorily similar will be more easily confused (Carnine, 1980c). Effective curriculum design requires seeing the world as students do. Likely misconceptions can be predicted and prevented, for example, by separating over time the introduction of similar elements such as *b* and *d* (Carnine, 1981). The care needed to teach clearly with examples is difficult for most adults to appreciate, because they already know basic concepts, such as *b*, *d*, *red*, and *longer*. Better examples for adults come from more advanced content—meiosis and mitosis, fusion and fission, affect and effect.

An even better way to appreciate the importance of example selection is to learn something new through examples. After thinking about examples *a* and *b* for Zug, readers should answer *c* and *d*.

a. Zug 20	b. Zug 24	c. Zug 21	d. Zug 8
15	18	7	2
5	6		

Answers of 14 for *c* and 6 for *d* are incorrect. Zug does not mean: "Find the difference between these numbers." Readers should try again with examples *e* through *j* of Zug and then try *c* and *d* again.

e. 25	f. 25	g. 20	h. 20	i. 6	j. 16
15	10	10	8	2	8
5	5	10	4	2	8

After working examples e through *j*, it should become clear that Zug means:

Educators are becoming increasingly cognizant of their responsibility to bring both life and clarity to their instruction through demonstrations, examples, and metaphors.

"Find the greatest common factor of these numbers." Correct responses to *c* and *d* would be 7 and 2, respectively. The second set of examples (*e-j*) is preferable, because it was constructed following these four research-based guidelines for teaching with examples.

- Select examples that preclude misconceptions (Carnine, 1980a). In examples *e* and *f*, the answers do not equal the difference between the two numbers.
- Present minimally different examples (Carnine, 1980b; Granzin & Carnine, 1977). Both examples *e* and *f* have 25 as the first number. Only the second number varies. Yet the answers are the same. The first numbers are also the same in examples *g* and *h*; however, the answers are not the same. Minimally different examples are relatively easy to compare, making it easier to identify relevant concept attributes.
- Give students practice until they respond correctly to 80-90 percent of the questions (Darch, Carnine, & Gersten, 1984).
- Use simple, consistent wording for both the examples and questions (Williams & Carnine, 1981).

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An obvious question is the degree to which this Direct Instruction approach to curriculum design contributes in a significant manner to student understanding. The next section reviews a portion of the findings on the Direct Instruction program. The results, however, reflect the contribution of a comprehensive instructional system with many components besides curriculum design—teacher expectations for student learning, teaching skills, the amount of time students spent engaged in academic activities, procedures for monitoring student learning, staff development, administrative support, and parental involvement.

Research on Direct Instruction

Research findings from a number of sources within and outside the United States have looked at students at different ages and with different needs. Taken as a whole, the findings attest to the potential of Direct Instruction as a viable approach to learning.

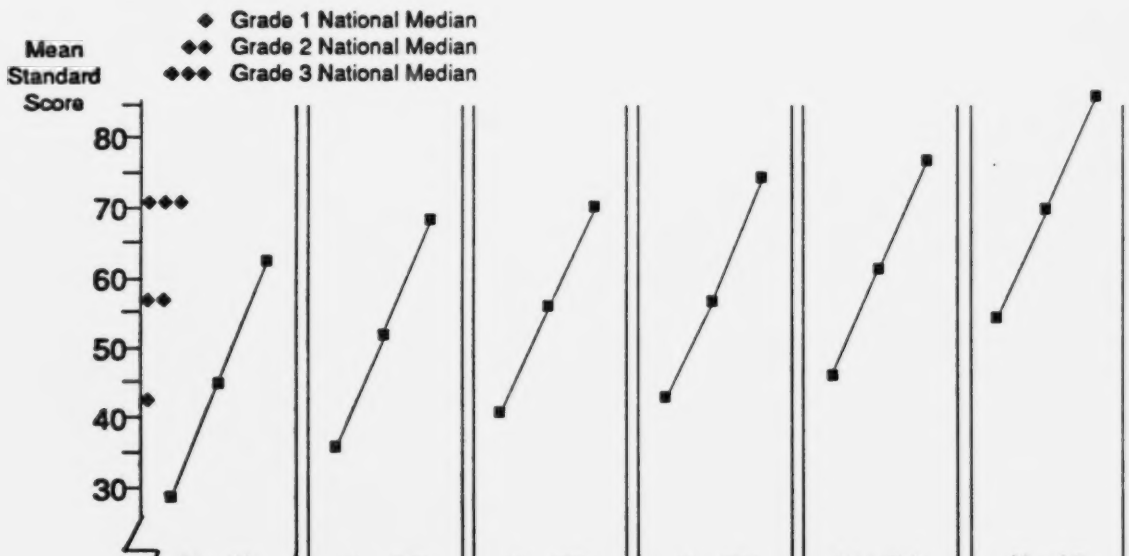
Findings From Follow Through Researchers

The National Follow Through Project included a large-scale longitudinal study of over 20 different approaches to teaching economically disadvantaged students in kindergarten through third grade. At the

project's peak, 7,500 low-income children from 170 communities participated each year. A wide range of low-income communities were represented.

Data collected by the sponsors of the Follow Through evaluation of Direct Instruction support the following conclusions.

- A greater measurable and educationally significant benefit is present at the end of third grade for those who began Direct Instruction in kindergarten than for those who began in first grade (Becker & Engelmann, 1978; Gersten, Darch, & Gleason, 1988).
- Significant gains in IQ are found, which are largely maintained through third grade. Students entering the program with IQs of more than 111 do not lose during the Follow Through years, though one might expect some repeated regression phenomena. The low-IQ children, on the other hand, display appreciable gains, even after the entry IQ has been "corrected." Students with IQs below 71 gain 17 points in the entering



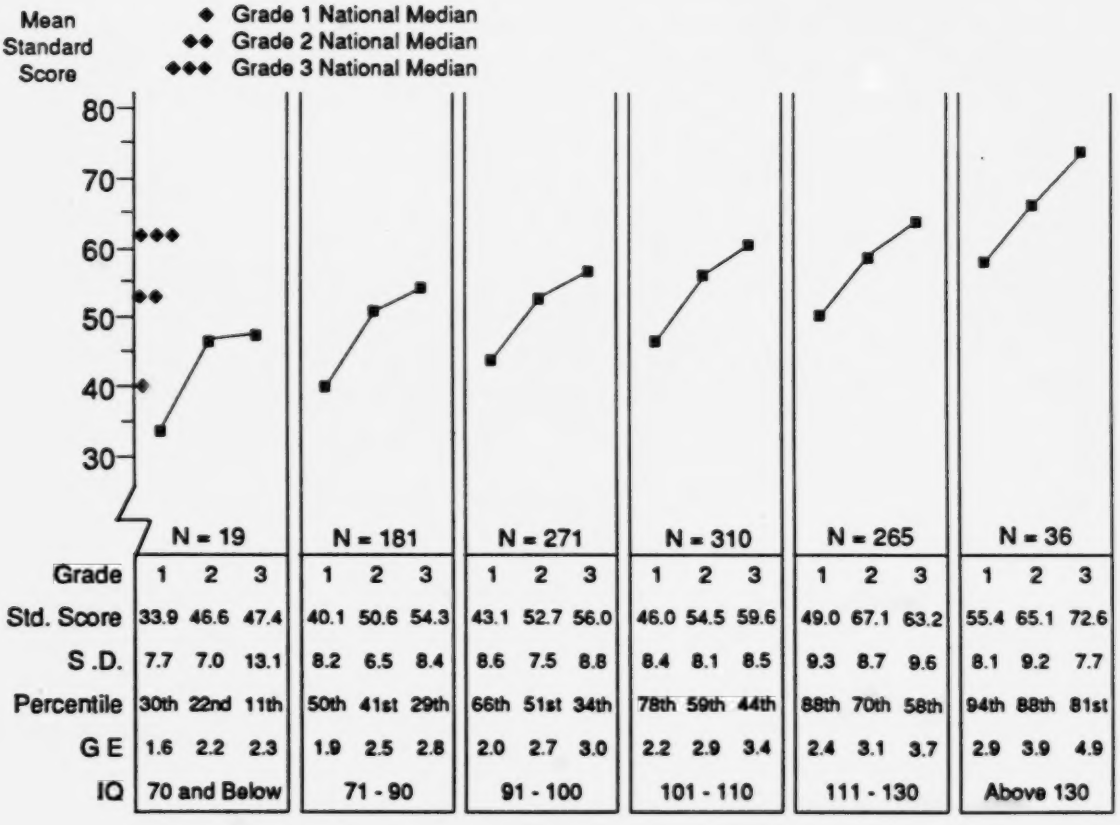
	N = 18			N = 176			N = 265			N = 301			N = 262			N = 34		
Grade	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Std. Score	29.2	46.1	62.6	35.8	51.4	67.7	40.0	55.2	69.7	42.6	56.9	73.5	45.6	60.2	76.4	54.4	69.2	85.1
S .D.	7.3	10.1	9.5	8.0	8.5	10.6	9.0	8.2	9.7	9.2	8.8	10.7	10.8	10.0	11.6	10.6	8.5	8.1
Percentile	10th	10th	24th	30th	22nd	39th	46th	38th	47th	51st	50th	61st	57th	63rd	69th	83rd	84th	88th
G E	1.2	2.0	3.2	1.5	2.3	3.5	1.7	2.5	3.7	1.8	2.7	4.0	2.0	3.0	4.3	2.5	3.6	5.3
IQ	70 and Below			71 - 90			91 - 100			101 - 110			111 - 130			Above 130		

Figure 1
Yearly Gains in Decoding for Students According to IQ

kindergarten sample and 9.4 points in the entering first-grade sample; gains for the children with entering IQs in the 71-90 range are 15.6 and 9.2 points, respectively (Gersten, Becker, Heiry, & White, 1984).

- Studies of low-IQ students (under 80) show that the program is clearly effective with students who have a higher probability of failure. As indicated in Figures 1 and 2, these students gain nearly as much each year in reading (decoding) and math, as the Direct Instruction students with higher IQs—more than a year per year on the Wide-Range Achievement Test (WRAT) in reading, but year for year on MAT Total Math (Gersten, Becker, Heiry, & White, 1984).

- Followup studies of Direct Instruction and comparison students were carried out in five districts. All the significant differences favored the Direct Instruction students: five on academic measures, three on attendance, two on college acceptance, and three on reduced retention rates (Gersten & Keating, 1987).



Grade	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Std. Score	33.9	46.6	47.4	40.1	50.6	54.3	43.1	52.7	56.0	46.0	54.5	59.6	49.0	67.1	63.2	55.4	65.1	72.6
S.D.	7.7	7.0	13.1	8.2	6.5	8.4	8.6	7.5	8.8	8.4	8.1	8.5	9.3	8.7	9.6	8.1	9.2	7.7
Percentile	30th	22nd	11th	50th	41st	29th	66th	51st	34th	78th	59th	44th	88th	70th	58th	94th	88th	81st
G E	1.6	2.2	2.3	1.9	2.5	2.8	2.0	2.7	3.0	2.2	2.9	3.4	2.4	3.1	3.7	2.9	3.9	4.9
IQ	70 and Below			71 - 90			91 - 100			101 - 110			111 - 130			Above 130		

Figure 2
Yearly Gains in Math for Students According to IQ

- **The model generalizes across both time and populations. The Department of Education has a Joint Dissemination Review Panel that validates educational programs as exemplary and qualifies them for national dissemination. During the 1980-1981 school year, the last of the 12 Direct Instruction Follow Through projects were submitted for validation. Of the 12 districts, 11 had 8-10 years of data on successive groups of children. The schools sampled a full range of students: large cities (New York, San Diego, Washington, DC), middle-sized cities (Flint, MI; Dayton, OH; East St. Louis, IL); rural white communities (Flippin, AR; Smithville, TN); a rural black community (Williamsburg, SC); Latino communities (Uvalde, TX; East Las Vegas, NM); and a Native American community (Cherokee, NC). One hundred percent of the projects were certified as exemplary in reading and mathematics for the primary grades, thus providing replication over 8-10 years in a dozen quite diverse communities.**

The Concept of Direct Instruction

In 1976, Barak Rosenshine introduced a narrower concept of direct instruction into the mainstream of educational research. His synthesis of many classroom observational studies indicated that students consistently demonstrate higher reading achievement scores when their teachers do the following:

- devote substantial time to active instruction,
- break complex skills and concepts into small, easy-to-understand steps and systematically teach in a step-by-step fashion,
- ensure that all students operate at a high rate of success,
- provide immediate feedback to students about the accuracy of their work, and
- conduct much of the instruction in small groups to allow for frequent student-teacher interactions.

The Components of the Direct Instruction Model

While the procedures Rosenshine identified are also found in the Direct Instruction model, the Direct Instruction model is much more comprehensive, including teacher expectations for student learning, the curriculum, teaching skills, the amount of time students spend engaged in academic activities, procedures for monitoring student learning, staff development, administrative support, and parent involvement. This comprehensiveness grew out of many failures working with school districts in a dozen states over a 20-year period. A well designed curriculum was of little value if teachers did not have the skills to use it. These skills were not easy to acquire, making staff development crucial. Even with the skills and materials, teachers who did not believe low-income minority students could succeed in school would not put forth the effort required to teach their students. At that time administrative leadership became crucial. The point is that the variables that influence student learning are numerous and interactive. Producing the greatest gains with at-risk students requires

orchestrating these many variables so that they operate in concert.

An integrated educational delivery system built around a curriculum such as Direct Instruction is difficult to implement. Consider the component of teaching techniques. Teachers are trained to place and group students so as to produce the best results for each child, to present the tasks from Direct Instruction programs, and to reinforce accurate responses and correct student mistakes. Techniques for helping students who make frequent mistakes are particularly difficult to learn. Teachers often ignore a student's errors, call on another student to give the answer, or give the answer themselves. The problem with these strategies is that many questions require students to carry out a multistep procedure to come up with an answer. For example, in one study (Collins, Carnine, & Gersten, 1987) students with learning disabilities followed a multistep procedure to draw a conclusion based on two statements of evidence. The study compared two methods for responding to student errors. Students who were reminded of the multistep procedure after making a mistake, and not just given the answer, had significantly higher scores at the end of the study.

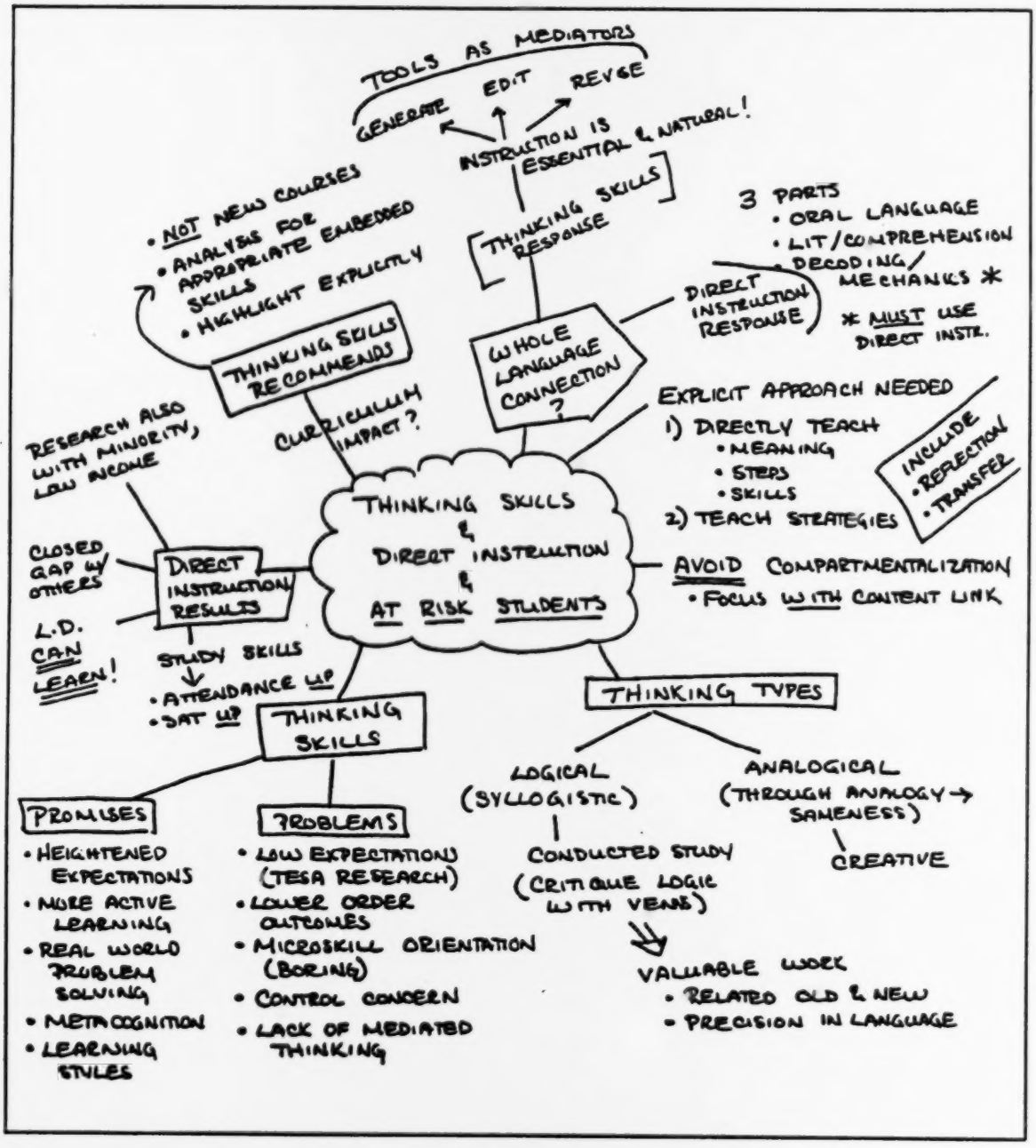
Producing the greatest gains with at-risk students requires orchestrating these many variables so that they operate in concert.

Reminding students of the procedures to follow and other teaching techniques are important only to the extent that they are used by teachers. Training teachers to use effective techniques is a crucial aspect of the Direct Instruction model. However, the training is not achieved through lectures, discussions, or conferences alone. In an extensive review of the research on inservice, Showers and Joyce (1981) suggest that theory or theory and demonstrations resulted in a successful rate of transfer to the classroom of only about 10 percent. Adding role playing increased the percentage only slightly. The addition of coaching, however, produced a dramatic increase in transfer, one that approached 90 percent. In Direct Instruction, training is usually accomplished through a workshop just before school begins, continuing inservice sessions, and in-classroom coaching.

Expectations

Although coaching can be effective, most teachers find it intrusive and threatening, at least initially. Gersten, Carnine, Zoref, and Cronin (1986) found that only after six months of coaching did teachers recognize the benefits of coaching. Only after teachers saw student progress that they had previously thought to be impossible did they increase their expectations for their students. The dilemma is that teachers do not raise their expectations until they see that their students actually can perform at much higher levels, yet they resist intrusive interventions like coaching that are often necessary to significantly improve the teaching-learning process. Only with strong support from some of the participating teachers and key administrators are large scale implementations of Direct Instruction possible.

One of the most important findings from the National Follow Through Project was that students entering kindergarten who would typically be expected to fail in school could achieve at close to the national average. Direct Instruction Follow Through students, all of whom were from economically disadvantaged



homes and who were over 90 percent minority, scored about as well as the median of the test's norming sample. This finding and similar ones with special education populations are important because they justify higher expectations on the part of educators.

High expectations should not be associated with cold, robotlike behavior, though. The best combination of teacher behaviors seems to be warmth and active "demandingness," two aspects of effective teaching identified by Kleinfield (1975):

> The first and most important characteristic is the effective teacher's ability to create a climate of emotional warmth that dissipates students' fears in the classroom and fulfills their expectations of a highly personalized relationship. The second characteristic is the teacher's ability to resolve his own ambivalent feelings about the legitimacy of his educational goals and express his concern for the students, not by passive sympathy, but by demanding a high quality of academic work. (p. 318)

Conclusion

Direct Instruction was originally designed to increase the competence and self-esteem of at-risk, elementary-grade students. In recent years the system has been extended to science and math for secondary students and computer science for university students. The data indicate that students taught with Direct Instruction reach the designated cognitive and affective goals. However, the program goes against the grain of most educators and is difficult to implement. Even so, as the nation's education problems increase, the Direct Instruction model will receive increased attention.

The following two examples suggest that the time may be at hand. Over 80 percent of the students who score in the bottom quartile in fourth grade won't finish high school. A young Black in California is four times as likely to be murdered as be eligible for admission to the University of California system.

Society cannot afford to view an effective education as charity, something that may be provided out of kindness to those in need. When Social Security began, 67 workers supported one retiree; by 1990, only three workers will be supporting one retiree and one of those workers will be a minority. It is projected that within the next 30 years, almost half of the public school students in the United States will represent minorities. Their educational needs can no longer be ignored.

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The 4MAT System: A Model for Teaching to Learning Styles with Right/Left Mode Techniques

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This paper presents aspects of 4MAT, a system that assists educators in designing instruction that focuses on all four learning styles or ways in which people learn. Rather than using a fixed pattern of instruction (a temptation in some school environments), educators must make a conscious effort to become aware of the various ways in which people perceive and process information. A teacher's use of multiple instructional strategies allows a student to learn in his or her natural style, but also challenges a student to learn in styles other than that natural, "comfortable" style. Educators, then, can best serve their students by acknowledging—through the use of varied instructional strategies—and celebrating the differences in learning styles among students.

THE 4MAT SYSTEM is a model for instructional design developed by Bernice McCarthy in 1979. It incorporates research in learning styles, hemisphericity, art and movement, management training, and creativity.

4MAT is an open model, a tool. It provides teachers with a systematic framework for designing instruction using multiple methodologies. These procedures guide students through a cycle of learning from personal experience to conceptual understanding to application of knowledge in the real world. Learners are, therefore, able to learn in their most comfortable mode part of the time and are challenged by other ways of learning part of the time. 4MAT is not, therefore, a model for diagnosing and prescribing individual learning style preferences. Rather, it provides an instructional construct which is applicable to learners of all ages and to all content areas.

During the past nine years, the 4MAT System has been shared with thousands of educators worldwide. Based on this extensive work in staff development, this paper puts forth two major premises:

1. All learners have major learning styles and brain dominance differences.
2. Designing and using multiple instructional strategies to teach to these styles can improve teaching and learning.

All Learners Have Major Learning Styles and Brain Dominance Differences

Learning styles are approaches to learning developed by individuals over time. An individual's learning style, therefore, is fluid, not static.

Individual learning styles depend on many things: who people are, where they are, how they see themselves, what they pay attention to, and what others ask and expect of them. As they each react to the experience and information encountered, they develop and adapt abilities that tend

to emphasize some orientations over others. Such adaptations or possibility-processing structures form the personal bases of learning.

According to David Kolb (1984), whose research forms the basis for the learning style theory presented here, there are two major differences in how people learn. The first is how they perceive; the second is how they process.

People perceive reality differently. They take things in different ways. (See Figure 1 below.) In new situations, some people's primary response is to sense and feel their way, while others think things through. No one uses one response to the total exclusion of the other. However, in their reactions, people hover near different places on a continuum, and that hovering place is their most comfortable place.

While demonstrably different from each other, both kinds of perception—feeling mode and thinking mode—complement rather than exclude each other. Both are equally valuable. Both have strengths and weaknesses. Most important of all, every learner needs both for the fullest possible entry into new experience.

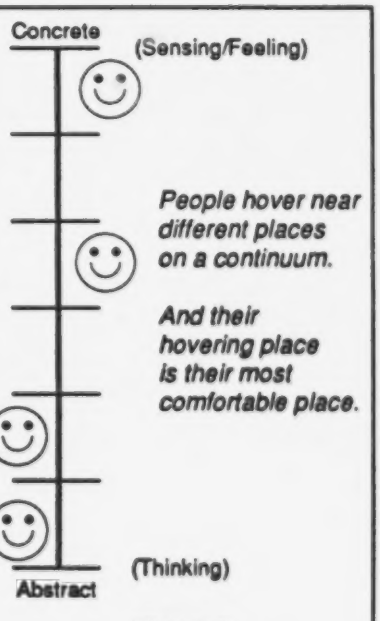


Figure 1
How People Perceive

Perception alone, however, does not equal learning. The particular perceiving orientation one favors over time, the feeling or the thinking, forms one of two major determinants of personal learning style. In order for learning to happen, perception must be followed by processing.

The second major difference in how people learn is how they process experience and information, how they make it part of themselves (see Figure 2).

The processing dimension is a continuum that ranges from the need to internalize to the need to act, from the specific personal fit, to manipulation and usefulness in the larger world. Watchers need to refine their reflective gifts while also developing the courage to experiment and try. And doers need to refine their experimenting gifts, while also developing the patience to watch reflectively.

Both kinds of perceiving, the concrete and the abstract, and both kinds of processing, the reflective and the active, are equally valuable. To allow and encourage students to move across both is to encourage excellence. The particular way people perceive and process is the best way for them, their most comfortable place. It is the stepping-off place from which they move toward wholeness. It is their favored place in the sequence of knowing. These differences are not higher or lower levels of knowing. They are just different. These differences are not negative; they are not deficits. Quite the opposite, they offer opportunities for growth.

Learning Style Characteristics

David Kolb (1974), following the work of Kurt Lewin (1951), Jean Piaget (1975), and John Dewey (1910, 1938), took these two dimensions of perceiving and processing and juxtaposed them to form a four-quadrant model. The result of this structure was the delineation of the boundaries for four major learning styles (see Figure 3).

David Kolb's research represented a breakthrough, because it formulated learning style findings into model form. But Kolb's contributions did not end

with the model. He went on to analyze the different types of learners. Kolb (1974) notes that a person's dominant learning abilities are the "result of our hereditary equipment, our particular past life experiences, and the demands of our present environment."

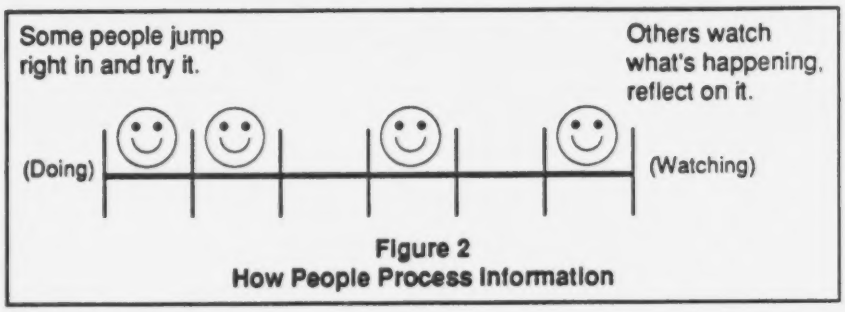


Figure 2
How People Process Information

The findings of other learning style researchers (Hunt, 1964; Jung, 1976; Lawrence, 1982; Merrill & Reid, 1976; Simon & Byram, 1977) are strikingly similar. In fields ranging from psychology to management training, researchers have made nearly the same discoveries. Though they worked separately, with different techniques, in different areas, researchers came up with almost perfectly parallel learning schemes. One way to see how similar they are is to summarize their findings by overlaying them on the model developed by Kolb. A set of descriptors for each learning style emerges.

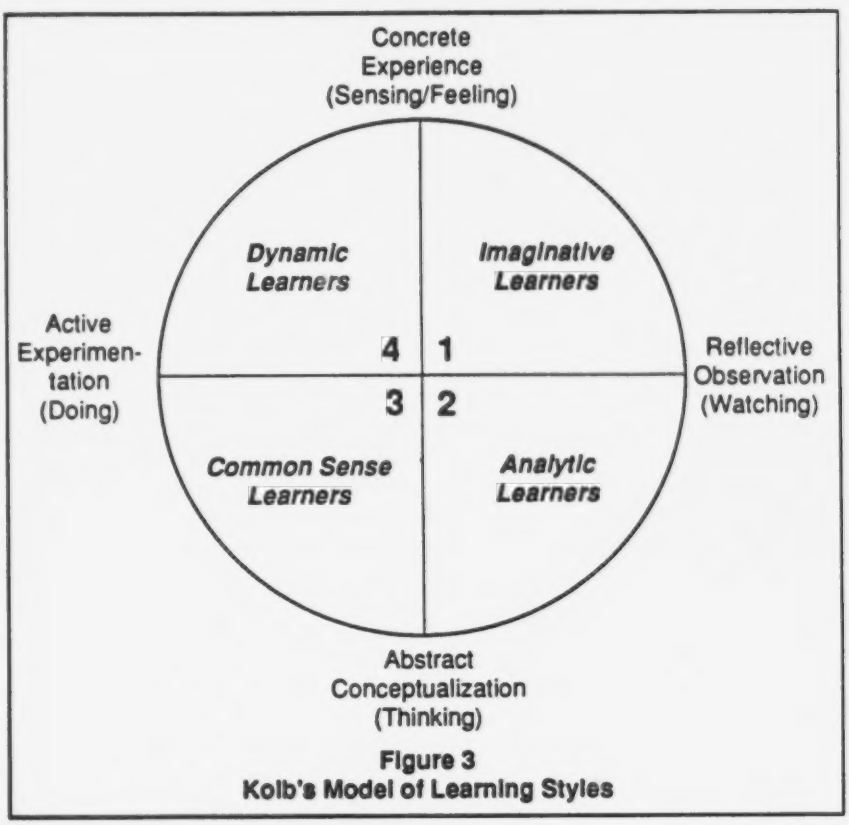


Figure 3
Kolb's Model of Learning Styles

Type one: imaginative learners. They perceive information concretely and process it reflectively. They integrate experience with the self.
They learn by listening and sharing ideas. They are imaginative thinkers who believe in their own experiences. They excel in viewing direct experience from many perspectives. They value insight thinking. They work for harmony. They need to be personally involved. They seek commitment. They are interested in people and culture. They are thoughtful and enjoy observing others. They absorb reality. Sometimes, because they see all sides, they have difficulty making decisions. They seek meaning and clarity.

Type two: analytic learners. They perceive information abstractly and process it reflectively. They devise theories by integrating their

observations into what is known. They seek continuity. They need to know what the experts think. They learn by thinking through ideas. They form reality. They value sequential thinking. They need details. They critique information and collect data. They are thorough and industrious. They will reexamine the facts if situations perplex them. They enjoy traditional classrooms. They find ideas fascinating. They prefer to maximize certainty and are uncomfortable with subjective judgments. Sometimes they seem cool and aloof. They seek intellectual competence and personal effectiveness.

Type three: common sense learners. They perceive information abstractly and process it actively. They integrate theory and practice. They learn by testing theories and applying common sense. They are pragmatists. They believe if something works, use it. They are down-to-earth problem-solvers who resent being given answers. They do not stand on ceremony but get right to the point. They have a limited tolerance for fuzzy ideas. They value strategic thinking. They are skills oriented. They experiment and tinker with things. They need to know how things work. They edit reality and cut right to the heart of things.

Type four: dynamic learners. They perceive information concretely and process it actively. They integrate experience and application. They learn by trial and error. They are believers in self-discovery. They are enthusiastic about new things. They are adaptable, even relish change. They excel when flexibility is needed. They often reach accurate conclusions in the absence of logical justification. They are risk takers who are at ease with people. They enrich reality by taking what is and adding something of themselves to it. They are sometimes seen as manipulative and pushy. They seek to influence.

Brain Hemisphere Dominance and Learning Styles

Brain hemisphere research further expands the consideration of learning styles. Current research on right and left brain functions began with Roger Sperry's (1973) animal studies during the 1950s and continued with similar operations on human patients in the 1960s. Major findings of this ongoing study were:

- The two halves of the brain, right and left hemispheres, process information differently.
- Humans are a two-brained species, each having its own special mind.
- Both hemispheres are equally important.

Joseph Bogen (1975), a neurosurgeon and collaborator of Sperry, suggests that individuals rely more on one information processing mode than the other, especially when they approach new learning. Research typically describes the left mode as serial, analytic, rational, and verbal. The right mode is described as global, visual, and holistic, able to see patterns and connections. Table 1 (right) lists additional attributes of left and right mode processing.

People who approach learning with a left mode processing preference have beautiful gifts. They are systematic, they solve problems by looking at the parts, they are sequential and are excellent planners. They are analytic.

People who approach learning with a right mode processing preference have beautiful gifts. They see patterns, they solve problems by looking at the whole picture. They are random and arrive at accurate conclu-

Table 1
Left and Right Brain Characteristics

Left Mode	Right Mode
Rational	Intuitive
Responds to verbal instructions	Responds to demonstrated instructions
Likes controlled systematic experiments	Likes open-ended, random experiments
Prefers established, certain information	Prefers elusive, uncertain information
Objective	Subjective
Looks at differences	Looks at similarities
Analyzes	Synthesizes
Exhibits primary reliance on language in thinking and remembering	Exhibits primary reliance on images in remembering
Prefers objective tests	Prefers essay tests
Sees cause and effect	Sees correspondences
Controls feelings	Is free with feelings
Prefers hierarchical authority	Prefers collegial authority
Excels in propositional language	Excels in poetic, metaphoric language
Sees design details	Sees overall design form
Digitalized	Patterned
Formal laws	Paradigms—shared theories
Superior in:	Superior in:
Writing	Drawing
Digit and letter recognition	Verbal material when imagery is used to code
Nameable shapes	Nonverbal dimensions: light, hue, depth
Word recognition and recall	Photographs, schematic figures
Phonics discriminations	Tactile discriminations
Serial, analytic difference detection	Rapid, global, identity matching

sions in the absence of logical justification. They are intuitive. People who access their whole brain flex and grow. They have both sets of beautiful gifts.

Several studies have been done to determine students' learning style preferences, brain hemisphere dominance, and what relationship exists between learning styles and right, left, and whole brained processing preferences. Among the important conclusions that emerged were these points:

- Approximately equal percentages of boys and girls fall into each of the four learning style groups.
- During formal schooling years, students tend to favor the concrete experience dimension over the abstract dimension.
- More students were right mode dominant than left mode dominant.
- Each of the four learning style quadrants had right mode, left mode, and whole brained students.
- These brain dominance characteristics are related to sex in some as yet undetermined way.
- These brain dominance characteristics are related to age and educational experience in some complex

interaction with the dimensions of concreteness and abstractness in some as yet undetermined way.

- There is a strong tendency toward left mode in quadrants two and three and a strong tendency toward right mode in quadrants one and four. So the relationship between the concrete and the right mode and the abstract and the left mode is a strong one.

If it is true, as research conclusively shows, that students have major learning style differences, then it is almost tautological to state that these learning styles have important ramifications for instructional strategies. It is to that second premise that this paper now turns.

Designing and Using Diverse Instructional Strategies to Teach to Learning Styles Can Improve Both Teaching and Learning

While the scientific identification of styles and their complex causes is important, educators do not need to wait for refined knowledge to act. They can improve pedagogy by using diverse strategies in a cycle of learning. This cycle needs to appeal to each student's most comfortable style in turn, while stretching them to function in less comfortable modes.

Kolb's model is important not only because it creates parameters that classify styles, but also because it presents a cycle of learning. The movement is from experience, to reflection, to conceptualization, to experimentation. (See Figure 4.) Then the cycle begins again, with new, richer experiences in ever-widening spirals. In this way, all students, whatever their learning styles, have an opportunity to shine 25 percent of the time. That has not been possible in most schools in the past. It is still not possible in many schools today.

Schools primarily teach in quadrants two and three and in the left mode, giving information to passive receivers and requiring the completion of workbooks and questions at the end of chapters in order to get to the next chapter. This, of course, is inadequate instruction. Students need the completeness of all four quadrants progressing from experience to reflection to conceptualization to experimentation, using both modes of information processing, right and left. Students need to go through the complete cycle.

This movement around the circle is a natural learning progression. Humans sense and feel, they experience; then they watch, they reflect; then they think, they develop theories; and then they try out theories, they experiment. Finally, they apply what they have learned to the next similar experience. They get smarter. They apply experience to experience.

Each of the learning style types has a quadrant where he or she is most comfortable, where success comes easily. The imaginative learners, those who fall in quadrant one, prefer to learn by sensing/feeling and watching. The analytic learners, those who fall in quadrant two, prefer to learn by thinking and watching. The common sense learners, those who fall in quadrant three, prefer to learn by thinking and doing. And the dynamic learners, those who fall in quadrant four, prefer to learn by sensing/feeling and doing. All of the learners need all of the cycle. The cycle is more important than any one segment.

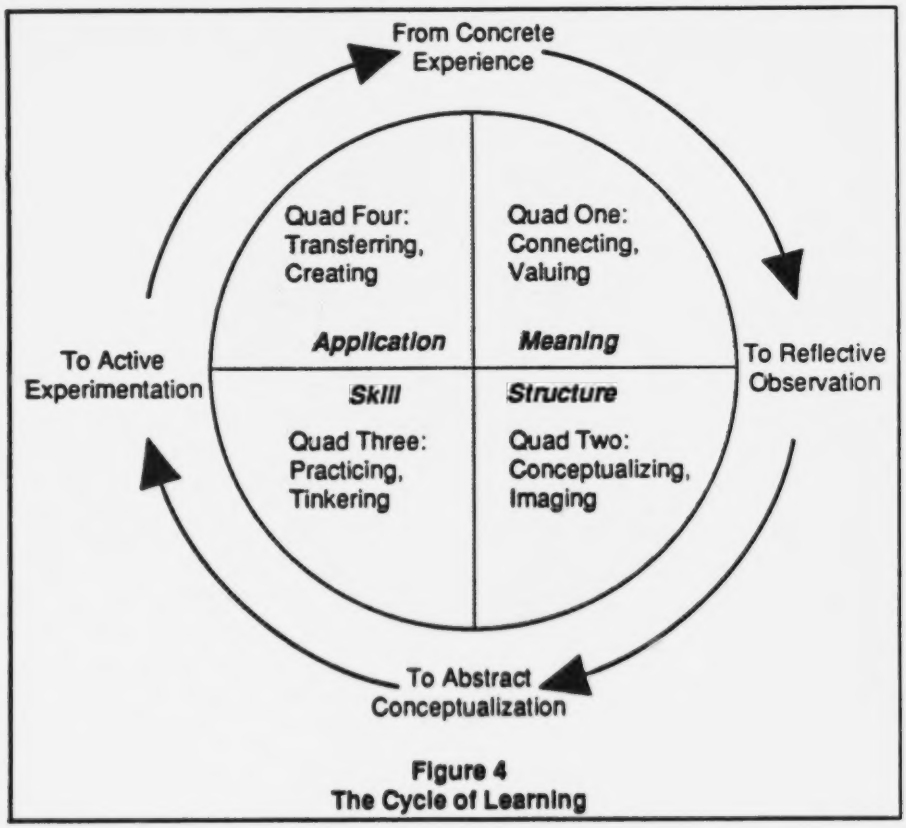


Figure 4
The Cycle of Learning

Percentages in the research already cited indicate there are right, left, and whole brain learners in each of the four learning style quadrants. So the decision to create teaching strategies where left and right mode techniques are alternated through a four-learning-style cycle seems to be a common sense approach to teaching. If all four learning styles are taught to all students in a cycle that alternates from right to left mode information processing, and if in the doing, all styles are equally valued, this integration will allow students to be comfortable some of the time and stretched and challenged some of the time.

If the brain dominance of particular students was determined to be strongly right mode, then these students need a concrete, intuitive, gestalt approach to learning. It is necessary to allow such students to learn through the medium of their natural gifts. However, they also need to develop the abilities to abstract, to intellectualize, to break down and classify, and to use sequential logic. To do less for such students is to deny their potential.

Educators can use the available instruments as tools. They can identify strengths and weaknesses with wisdom. But foremost in the search for answering individual differences in students must be to find strategies that encompass the wonderful complexity students represent. The emphasis should be on valuing the differences.

One Example of a Model: The 4MAT System

Based on the conviction that schools need to enhance whole brained thinking, tasks and strategies were devised to call forth what it is believed are strong left and right mode responses. This requirement, to alternate between analysis and synthesis, was superimposed on the four learning style methodologies. The result is the 4MAT System.

4MAT is an attempt to help teachers and trainers design instruction and create strategies that appeal to all four learning styles, thereby requiring of students that they become more effective in alternate ways of

learning, as well as functioning in their favorite style. The resulting cycle is a powerful teaching tool. It moves from meaning and motivation to conceptual understanding, then to problem-solving and skills, and lastly to the creative use of the material learned. It requires much, much more than facts recall. It requires that learners connect content to their own lives, understand the structural connections of the material, use what they learn in real situations, and design individual unique applications.

Learning styles are profoundly different, and educators need to honor and celebrate these differences, not see them as deficits. But the real meaning of learning style theory lies in the process required to move all learners through a cycle of learning, a cycle that encompasses all four learning styles, while still honoring and developing the uniqueness of each style.

Foremost in the search for answering individual differences in students must be to find strategies that encompass the wonderful complexity students represent.

While many teachers have shared classroom success stories with 4MAT staff, the growing numbers of anecdotal reports are not sufficient to demonstrate the impact of the 4MAT System on students, teachers, and administrators.

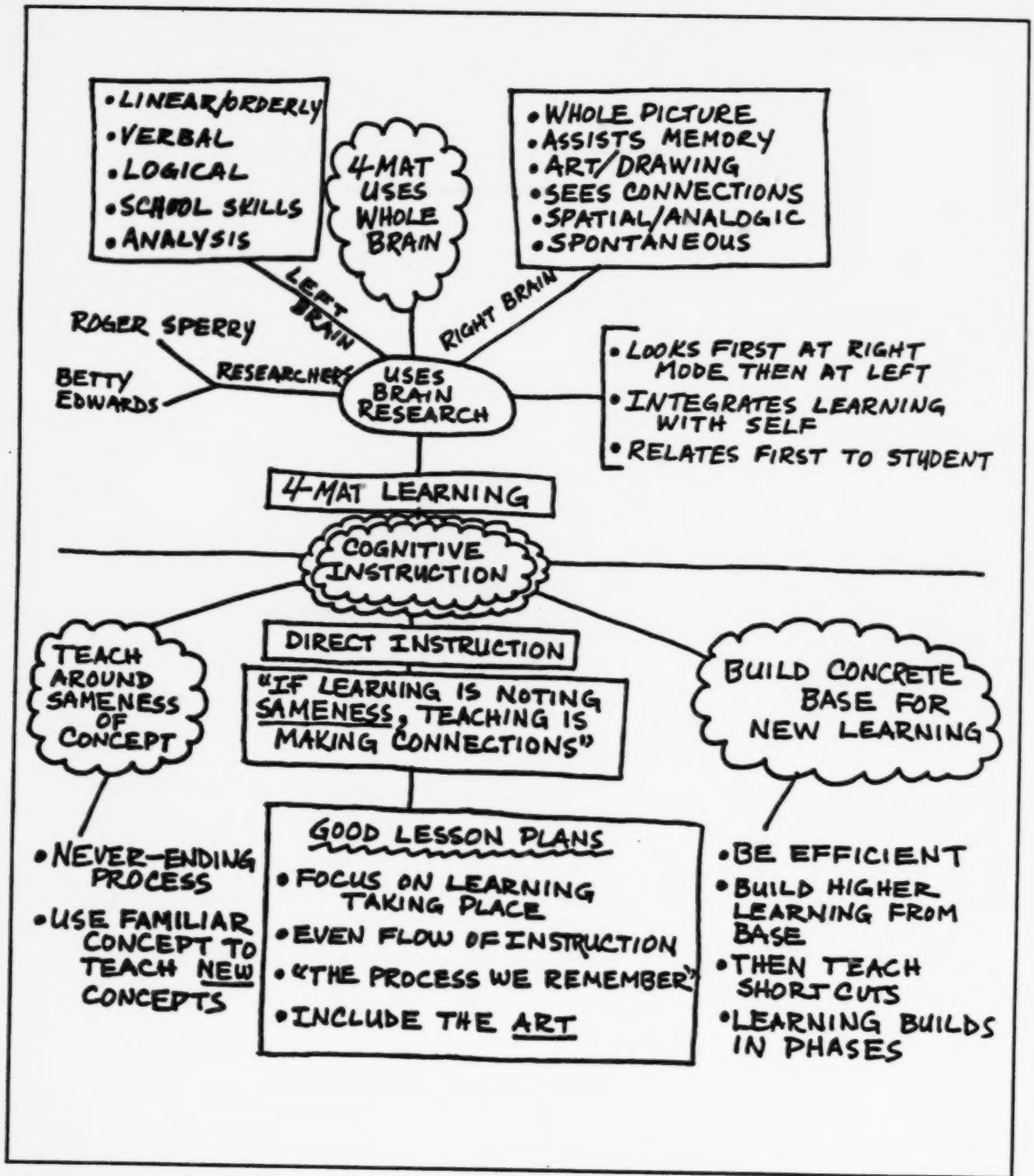
Before attending to student outcomes, however, it is necessary to be sure that 4MAT is actually taking place in the classroom. The training program offered by EXCEL includes fundamental, intermediate, and advanced workshops, along with continuous assistance in writing lesson plans and understanding the system.

During the first year of implementation of 4MAT in a school system, teacher participants complete several measures designed to determine the degree to which they:

- have attitudes about teaching and learning that are consistent with 4MAT assumptions;
- have mastered the principles of 4MAT, including the learning styles and brain hemisphericity theory; and
- can write a 4MAT lesson plan with appropriate learning activities in all eight steps.

Instruments have been designed to measure attitudes about teaching and learning and knowledge of learning styles and hemisphericity. These instruments possess traditional psychometric properties of reliability and validity, as demonstrated by previous studies. The measures are given early in the implementation and again late in the academic year. An early and late lesson plan are also submitted for rating. Finally, teachers complete field test reaction sheets, allowing them to document the teaching of their 4MAT lessons along with their perceptions of the strengths and weaknesses of the 4MAT System.

At this time, studies on teacher change have been conducted in Boston and Taunton, Massachusetts (Lieberman, 1986, 1987b); Fairfax County, Virginia (Lieberman, 1987a); and Honolulu, Hawaii (Lieberman, 1988). In each case, teachers showed statistically significant growth in understanding 4MAT principles, having attitudes consistent with 4MAT assumptions, and skill in writing lesson plans. In addition, their experiences piloting a 4MAT lesson and their perception of the strengths and weaknesses of 4MAT have aided in the improvement of training strategies for



increased utility, clarity, and comprehensiveness.

An early study on student outcomes was conducted in Kirkwood, Missouri (Benezra, 1985), where two of five 4MAT classes outperformed matched control classes teaching to the same objectives, but primarily using reading and discussion. The difference was statistically significant in

only one of the two, and none of the other differences was significant. However, the pre- and posttests used were developed without close attention to representing four learning styles and two hemispheric modalities. The classes were in social studies, language arts, mathematics, and science.

If educators are to serve all students, they must turn to serious study of them, focusing on how they learn, as well as what they learn.

In 1987, a study was conducted in North Carolina (Wilkerson, 1988) with third grade, urban, racially mixed students randomly assigned to experimental (4MAT) and control groups. Outcomes included achievement, attitudes, and interest. Two posttests, one administered immediately after a science unit on simple machines and another given 35 days later, showed significant differences favoring the 4MAT students. The researcher prepared the 4MAT lesson plans, and the control teachers used procedures outlined in the teacher's guide accompanying their textbook. In summary, this study used several forms of control employed in laboratory experiments, including randomized assignment to groups and standardized procedures, and found results showing the effectiveness of 4MAT.

Now that significant positive effects of 4MAT have been found in a tightly controlled experimental study, the magnitude of effects in a more field-oriented situation must be examined. In Fairfax County, Virginia, a second phase of implementation is presently in place. During 1987-88, 18 sixth-grade teachers, nine 4MAT and nine control, taught a unit on geometry with agreed upon objectives. Each teacher designed a lesson plan to achieve the goals, and the 4MAT lessons were reviewed for fidelity to the model. Students were pretested before the unit, posttested immediately after the unit, and retested one month later to measure retention. 4MAT students learned 14 percent more immediately after the unit and retained 18 percent more when retested one month later.

This early and admittedly sketchy research, as well as any glimpse of educational practice today, indicates that learning styles are here to stay. If educators are to serve all students, they must turn to serious study of them, focusing on how they learn, as well as what they learn. Educators need to know how different students are and how these differences affect the odds for success. It is the cycle suggested by learning styles and the instruction to be designed that hold the key to teaching and honoring all learners.

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Education: By Invitation Only

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This paper presents a model for invitational education, based on four key assumptions:

1. *People are able, valuable, and responsible and should be treated accordingly.*
2. *Education should be a collaborative, cooperative activity.*
3. *People possess untapped potential in all areas of human endeavor.*
4. *Human potential can best be realized by places, policies, and processes that are specifically designed to invite development, and by people who are intentionally inviting with themselves and others, personally and professionally.*

In addition, the authors suggest some practical strategies for making a school inviting—intellectually, psychologically, and physically.

IMAGINE A SCHOOL where students, teachers, administrators, support staff, parents, and community members work together so that everyone involved in the educative process develops his or her relatively untapped potential. What would such an inviting school be like?

Picture yourself and your family moving into a strange town. Your big question is: "What are the schools like?" You soon find out. Even before your move you obtain a copy of the town's paper and notice it contains several articles regarding the local schools. The high school choral group is planning a tour of Europe; a student wins a science prize; two teachers are just back from an archeological dig sponsored by the state university; a counselor has published a book of poetry. There is also a special column titled, "About Our Schools," which contains a list of upcoming events and activities. You immediately get the feeling that there is energy, pride, and purpose in the schools of this community.

When you and your family arrive in your new town, you spend considerable time with a realtor who is a real booster for the schools. She tells you she recently attended a breakfast reception for the town's realtors hosted by the high school principal. She states how impressed she was with the guided tour of the school facilities and the statement of educational purpose presented by a group of teachers. She describes how pleased she was with the overall professionalism of the school personnel.

As you find your way around the town, you notice that the local bank has student work on display, as do several stores and public buildings. That evening there is a special program on the local television station dealing with the recent academic successes of the local schools.

When the moving van is unloaded, you call the school to enroll your children. The school phone is answered promptly and courteously; the information you need is provided quickly and efficiently. The person on

the phone says how pleased the school will be to have your children as new students. An appointment is scheduled for you and your children to visit the school and complete the enrollment process.

As you drive onto the school grounds to enroll your children, you observe numerous, positively worded signs. Instead of "No Parking," the sign reads, "Please park in designated areas." Instead of "Visitors must report to the principal's office," the sign reads, "Welcome to our school. Please check in at the principal's office." There are parking spaces directly in front of the main entrance marked "Reserved for guests to our school." Other indications of the inviting school philosophy are everywhere. The grass is mowed, bushes trimmed, flowers planted, walkways clean, and the windows sparkle. Although the building was built more than a half-century ago, its physical condition conveys the sense of pride that everyone has in the school.

When you and your children enter the school and approach the principal's office, you smell fresh flowers and notice the green plants, fresh paint, and waxed floors. On entering the principal's office, you are promptly greeted by a professionally dressed school representative, who identifies herself, shakes hands with you and your children, and says that the school staff are looking forward to meeting your family. The representative then asks you and your children to be seated in a comfortable reception area while packets of orientation materials are quickly assembled for you. There is no traditional counter in this school office—only a receptionist's desk and comfortable furniture arranged to make you feel welcome. The attractive office decor makes you feel like you are in the reception area of a first-class corporation, more like IBM or Westinghouse than a traditional public school. A volunteer student guide soon arrives to take you and your children on a tour of the school.

After introducing himself in a friendly and confident manner, the student guide leads you and your children around the school. The first place you visit is a well-furnished and attractively decorated classroom, even though it is summer when classrooms are usually stripped. The guide explains that at least one classroom remains decorated all summer, like a model apartment, to show visitors what the whole building will look like when school begins.

Your student guide then takes you to a beautifully maintained cafeteria featuring a French village theme, with individual tables, awnings, plants, and scenic murals on the walls. The guide mentions that classical music is always played during lunchtime. "If we can't hear the music, we're being too loud," he explains.

Next you visit the teachers' lounge and workroom, where there is a large collection of professional journals, an honor-system lending library, and colorful bulletin boards with both professional and personal notices. Like the rest of the school, the room is clean and the air is fresh. A vending machine offers fruit juices. Judging by the posters, you conclude that this school faculty has an active wellness program in place.

Toward the end of your tour, you stop off at a student restroom and notice how clean it is; soap and paper-towel dispensers are provided; no graffiti is seen in the bathroom stalls. This is not the way you remember the restrooms when you were a student. At the end of your visit you and your children are escorted to your car and presented with a bumper sticker that reads:

"OUR SCHOOLS: THE MOST INVITING PLACE IN TOWN."

You are beginning to understand why.

When you arrive home and read the materials in the school information packet, attractively printed in the school colors, you learn that both the curricular and extracurricular activities call for a high level of student/teacher involvement. The simply worded statement on school policies reflects unconditional respect for everyone in the school. Rules are reasonable and enforceable. Most important, there is a genuine commitment to every student in the school.

The next day you receive a letter from the school thanking you for your visit and explaining that you will soon be contacted by members of volunteer groups that are part of the school family. These groups, from band boosters to room sponsors, from gardening clubs to older adult clubs, work in and around the school. They will be inviting your entire family to participate in the life of the school. As you settle in your new home, you have good feelings regarding your choice of this town and its outstanding school system.

Inviting schools like the one described here do not happen by accident. They are the products of intentional effort, sound thinking, and regular assessment, all based on a firm commitment to basic values regarding what people are like and how they should be educated.

This paper presents a conceptual model for invitational education and suggests some practical strategies for making your school the most inviting place in town—intellectually, psychologically, and physically. Such an endeavor is not easy, but it is always worth the effort.

What is Invitational Education?

Invitational education is a metaphor for an emerging model of the educative process consisting of four value-based assumptions about the nature of people and their potential. Invitational education provides both a theoretical framework and practical strategies for what educators can do to create schools where people want to be and want to learn.

The invitational education model was first introduced by Purkey (1978) and enriched and refined by Purkey and Novak (1984), Amos (1985), Purkey and Schmidt (1987), and others. The model has relevance for a variety of concerns in education, the latest being its application to classroom management (Purkey & Strahan, 1986).

As the theoretical framework of invitational education is presented, practical strategies labeled "Invitational Samplers" will illustrate the framework's concepts. These samplers, included throughout this paper, are only a few of the countless ways to invite success in schools. An example of an "Invitational Sampler" is displayed below.

Invitational Sampler

Share decisions whenever possible by involving others in the decisionmaking process. People who are excluded from decisionmaking soon become passive, lethargic, and even hostile to those who deny them opportunities to make choices that influence their lives. Students can participate in making decisions in such areas as rules of conduct, academic expectations, and school activities. The goal is to make people in the school feel that it is their school.

Four Assumptions of Invitational Education

Invitational education is as much an attitudinal disposition as it is a methodology. As such, it has wide application for people, policies, and programs. What distinguishes invitational education from other approaches to the educative process are four overarching assumptions, which, if violated for any reason, will compromise the spirit of invitational education. Following are the four assumptions.

1. **People are able, valuable, and responsible and should be treated accordingly.** How educators behave personally and professionally among themselves and with others is determined by whether they accept this assumption. If educators believe that some students are unable, worthless, and irresponsible, they will find ways to fulfill the prophecy. If educators believe that each student is able to learn, is worthy of respect, and can be responsible, they will find ways for students to succeed in school.

2. **Education should be a collaborative, cooperative activity.** Getting people to do what is desired without involving them in the process is like beating on cold iron. Even if the effort is successful, the energy expended is disproportionate to what is accomplished. There are moral and ethical issues involved in doing things ***with*** people as opposed to doing things ***to*** people. People are entitled to a voice in their own destiny.

3. **People possess untapped potential in all areas of human endeavor.** Curricula, policies, programs, and physical environments are all anchored in assumptions regarding individuals and their potential. As one high school student wrote, "Mr. Penn invited us to like ourselves and to take pride in our work. He expected a great deal of us and we did not let him down. He thought we were brighter than we were, so we were!" Human potential, though not always apparent, is always there, waiting to be discovered and invited forth.

4. **Human potential can best be realized by places, policies, and processes that are specifically designed to invite development, and by people who are intentionally inviting with themselves and others, personally and professionally.** This fourth assumption is at the very heart of invitational education, for it explains the ***how*** of the invitational model. In practice, invitational education focuses on the people, places, policies, and programs that transmit messages promoting human relationships and individual potential. Inviting schools are memorable; disinviting schools are unforgettable.

Invitational Sampler

Show appreciation. At times during the school year, perhaps at holidays, it is important for educators to express their appreciation to supporters of the school. Secretaries, custodians, aides, school volunteers, and others are important parts of the school family. Letting all these individuals know how much the school appreciates their contributions is essential to creating and maintaining an inviting school.

The above four assumptions of invitational education, dealing with what people are like and what education can be, serve as a framework for four elements that are critical to the invitational model. These are trust, respect, intentionality, and optimism. Each of these elements will now be considered in turn.

Elements of Invitational Education

In baseball, when the batter goes to the plate, he "digs in" to find the stance that feels right and provides the best chance of making solid contact with the baseball. A good stance does not guarantee a home run, but it does increase the chances of hitting the ball. The same is true of the stance provided by invitational education. Educators who accept the assumptions of the model and who operate from a position of trust, respect, intentionality, and optimism have a far greater chance of creating an inviting school.

Trust. Trust is manifested through an inviting pattern of action, not by any single act. Even when dealing with the most hostile and aggressive students, successful teachers remain in control and avoid responding in kind. Trust is created by the educator's consistent behavior over time, which establishes a dependable and predictable school environment.

Invitational Sampler

Display emblems of trust. Sometimes educators are so concerned about the prevention of vandalism or thievery that schools become like prisons, with locks on everything and warning signs everywhere. The result is that vandals and thieves appear to be running the school, creating distrust in everyone. When chances of success are good, educators should treat students as trustworthy. Students will live up, or down, to expectations.

In an inviting school environment, "emblems of trust" are everywhere. Rules are kept simple, supervision is low-key, students are allowed to handle expensive equipment. When students are encouraged to make significant choices in their lives, they are far mare likely, later in life, to maintain personal integrity in the face of external pressures and temptations.

Respect. The second element conveys an attitude of respect for the unique value, ability, and self-directing powers of people. This respect is given whether or not the respect is "earned." In invitational education, respect is a given—an undeniable birthright of each person.

When lapses of responsibility occur, offending students are consulted; they are asked to analyze their behavior and to make suggestions for improvement. When penalties are necessary, those responsible for discipline recognize the difference between a state trooper and a storm trooper. Penalties involve the loss of privileges, such as free time, rather than the loss of self-esteem, which occurs with corporal punishment.

Intentionality. Educators who subscribe to the invitational model do things on purpose, and for purposes they can explain and defend. They are intentional. Because they have a consistent position from which to make decisions, they know when they can be flexible if the situation calls for flexibility. They understand that to be intentionally inviting, when others are disinviting, is the true test of professionalism.

Optimism. The fourth and perhaps most important element is optimism. Optimism is the ability to live with the harshest of realities but still maintain a

positive view of the world. This optimism is not to be confused with a Pollyanna outlook; rather, it is the recognition that optimism is essential if development is to occur. In Goethe's words: "If we take people as they are, we make them worse. If we treat them as if they were what they ought to be, we help them to become what they are capable of becoming."

Those who accept the assumptions and elements of invitational education cannot be pessimistic. Invitational education affirms each person's present worth, while inviting all to realize their potential. An inviting act may be overlooked, but it is always valuable; even the smallest has boundless potential.

Theoretical Foundations of Invitational Education

Invitational education emanates from two theoretical perspectives: the perceptual tradition and self-concept theory. The following discussion deals with how these two perspectives contribute to the foundations of invitational education.

Invitational Sampler

Share success stories. The cup is not half-empty, it is half-full! Begin each faculty meeting on an optimistic note by reporting the successful experiences that have taken place since the last meeting. Even in the worst of situations there is room for optimism, so share accomplishments and success stories

The perceptual tradition. Why do people behave as they do? Throughout history philosophers and other scholars have answered this question in many ways. For example, a Freudian might say that people behave as they do because of internal dynamics of the unconscious. A behaviorist would emphasize the influence of environmental stimuli that preceded or followed a particular behavior. In contrast with these approaches, the perceptual tradition maintains that people do what they do because of how they perceive the world at the moment of behaving. This perceptual tradition maintains that each person is a conscious agent who considers, constructs, interprets, and then acts. And ultimately each person is responsible for his or her actions.

The perceptual tradition operates on the premise that all behavior is a function of the individual's ***perceived world***. A person's behavior may make little sense when observed from the "external" views of other people but makes great sense from the "internal" view of the experiencing person. For example, to an emotionally starved person, even the smallest inviting act may be seen as a feast.

Self-concept theory. Each person has a unique system of perceptions about self: Who am I? How do I fit into the world? How valuable, able, and responsible am I? Self-concept, then, is each individual's perception of his or her personal world and includes the following characteristics: (1) strives for stability by seeking orderliness and harmony; (2) functions to maintain, protect, and enhance itself; (3) seeks consistency by assimilating or rejecting perceptions that do or do not fit preconceptions; (4) allows change when desire is high and risk is low; (5) learns and develops as a result of inviting or disinviting experiences; and (6) constructs and reconstructs experience throughout life, layer by layer, experience by experience. Essentially, a good self-concept is little more than the memory of inviting acts, which are accepted, extended, and successfully acted on.

Some major concepts underlying invitational education have been presented. If educators want to create inviting schools, they must be able to describe, in ways that are conceptually

Invitational Sampler

Read behavior backwards. Rather than looking only at the behavior of a misbehaving student, an angry parent, or a cranky colleague, consider how the person might be viewing self, others, and the world. Sometimes students see themselves as more disinvited than undisciplined. By looking at the "why" of behavior, it is much easier to understand the "what."

sound, what the factors in the total school environment are that make it an inviting school and why they function as they do. Unfortunately, the educative process is frequently described by using "doing-to" terms. Educators talk in terms of "motivating," "building," "shaping," "enhancing," "reinforcing," or simply "making" students learn. As well-meaning as these efforts are, from the viewpoint of the perceptual tradition and self-concept theory, they are misguided. Students are not passive recipients or inert functionaries to be turned on, cranked out, or filled up.

This paper moves from theory to practice with examples of how the Four P's (Places, People, Policies, and Programs) work together to create and maintain inviting schools, where there are only advantaged students.

Theory into Practice: The Four P's

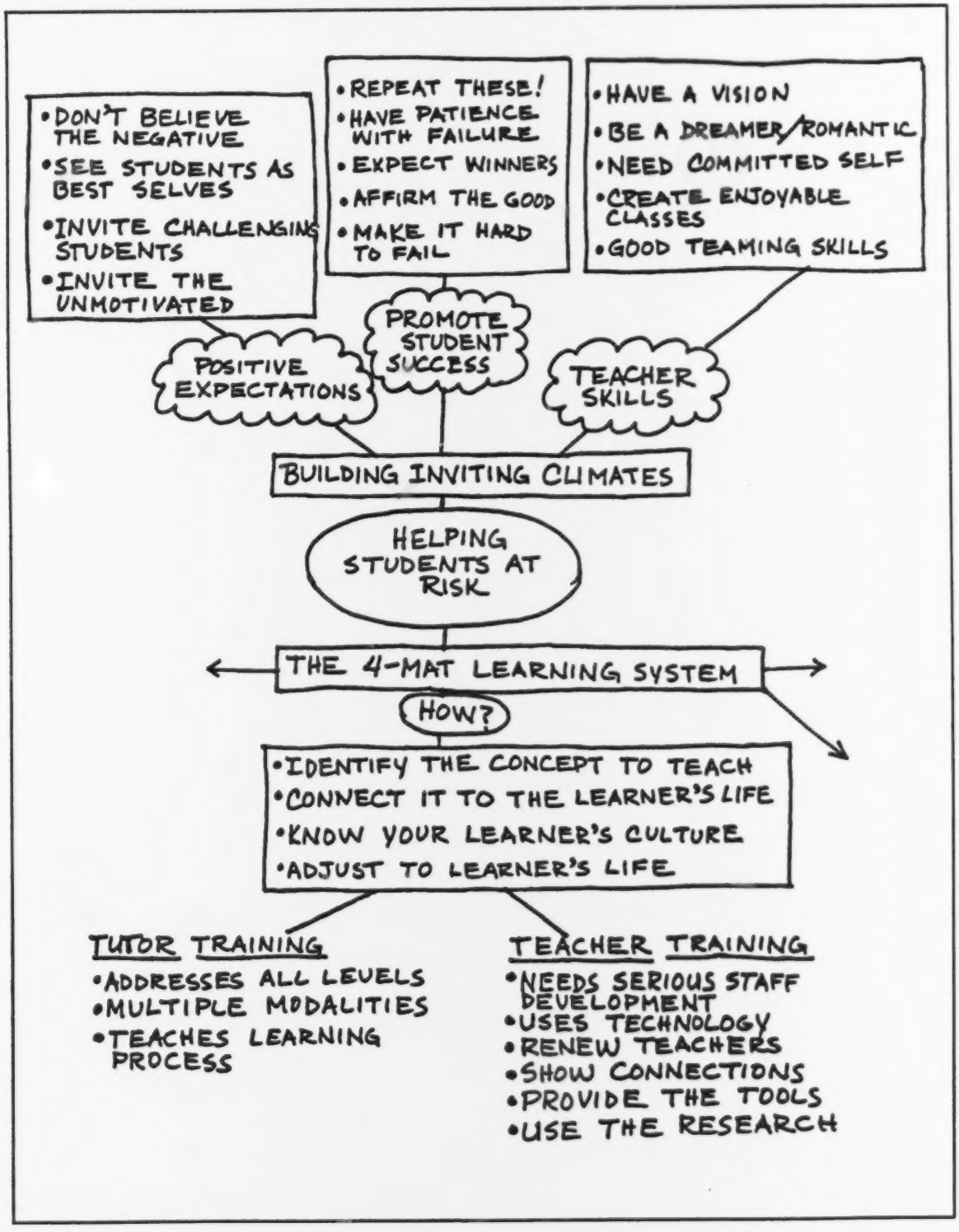
Just as everyone and everything in hospitals should aid in the promotion of health, so everyone and everything in schools should invite the realization of human potential. This involves the *places* (classrooms, offices, hallways, commons, restrooms, playing fields, gymnasiums, lawns, and libraries); the *people* (teachers, students, bus drivers, aides, volunteers, cafeteria staff, secretaries, nurses, librarians, coaches, counselors, custodians, crossing guards, and administrators); the *policies* (rules, codes, regulations, and procedures); and the *programs* (curricular and extracurricular, including the spirit in which the programs are conducted). Educators who pay careful attention to a school's places, people, policies, and programs can better ensure that each school day is an invitation to learning.

Places

Places offer an excellent beginning point for introducing invitational education to a school because they are so visible. If hallways are littered, paint is peeling, restrooms are smelly, classrooms dusty, offices cluttered, and cafeteria grimy, one can assume that the school's policies, programs, and people are the same. Places are the most obvious element in any school and are the easiest to change. They provide an opportunity for immediate improvement.

Invitational Sampler

Remember the Jello Principle. This principle maintains that everything and everybody is connected. If you poke the jello, all of it jiggles. If one teacher is rude to a parent, as far as that parent is concerned, the whole faculty is rude. Everything and everybody in the school make a statement for the entire school. Each person is an ambassador.


•DON'T BELIEVE THE NEGATIVE
•SEE STUDENTS AS BEST SELVES
•INVITE CHALLENGING STUDENTS
•INVITE THE UNMOTIVATED
•REPEAT THESE!
•HAVE PATIENCE WITH FAILURE
•EXPECT WINNERS
•AFFIRM THE GOOD
•MAKE IT HARD TO FAIL
•HAVE A VISION
•BE A DREAMER/ROMANTIC
•NEED COMMITTED SELF
•CREATE ENJOYABLE CLASSES
•GOOD TEAMING SKILLS
POSITIVE EXPECTATIONS
PROMOTE STUDENT SUCCESS
TEACHER SKILLS
BUILDING INVITING CLIMATES
HELPING STUDENTS AT RISK
THE 4-MAT LEARNING SYSTEM
HOW?
•IDENTIFY THE CONCEPT TO TEACH
•CONNECT IT TO THE LEARNER'S LIFE
•KNOW YOUR LEARNER'S CULTURE
•ADJUST TO LEARNER'S LIFE
TUTOR TRAINING
•ADDRESSES ALL LEVELS
•MULTIPLE MODALITIES
•TEACHES LEARNING PROCESS
TEACHER TRAINING
•NEEDS SERIOUS STAFF DEVELOPMENT
•USES TECHNOLOGY
•RENEW TEACHERS
•SHOW CONNECTIONS
•PROVIDE THE TOOLS
•USE THE RESEARCH

A secretary in a large middle school in North Carolina provides a good example of how changing the physical environment improves the working atmosphere. After her principal decided to renovate the school office with improved lighting, new furniture and carpeting, and removal of the tall counter, she reported: "It was as if I had been let out of prison!" Improving the physical environment may not have tangible benefits immediately, but it is important to assess physical facilities continuously to see if improvements are needed to enhance the working and learning atmosphere.

Invitational Sampler

Paint the locker room. A highly successful coach in Pennsylvania argues that the best way to have a winning football season is to paint the locker room. Perhaps the same is true for having a winning season in classrooms. Few things can make such an immediate improvement as a fresh coat of paint. Teachers teach better and students learn better in an inviting physical environment.

Policies

Policies refer to the rules, codes, and procedures used to regulate the ongoing functions of organizations. In schools, policies exist for such functions as discipline, personnel selection, bus routes, snow days, attendance, and visitation procedures, to name a few. Ultimately the policies created, be they formal or informal, communicate a strong message to people in the school and in the community about how things are to be done and where each person fits in. They also communicate views regarding whether or not people are seen as able, valuable, and responsible.

Sometimes, policies are created that, even though well-intentioned, place undue restrictions or burdens on individuals or groups. Some examples are a cafeteria policy requiring that an identical amount of food be served to each student whether he or she weighs 70 pounds or 270 pounds, an elementary principal who demands complete silence from children during their lunchtime, or buses that leave the school at a certain time regardless of whether students are aboard or not. Such insensitive, uncaring, or inappropriate policies have no place in an inviting school.

Programs

Advocates of invitational education are aware of the importance of programs. Sometimes well-intentioned programs are harmful to individuals or groups because they focus on narrow goals and neglect the wider scope of human needs. For example, some school programs group youngsters and give them a label, and the label becomes a stigma that negates the positive purposes for which these programs originally were created. Although some forms of grouping are necessary for instructional purposes, there is a clear danger in programs that label and group human beings. The invitational model requires educators to monitor programs that could detract from the goals for which they were designed. Advocates of invitational education

Invitational Sampler

Ensure quick line time. A student or teacher who has to stand in line for more than four minutes is wasting valuable time. Time in school should not be spent standing in line. Review procedures so that faculty, staff, and students can avoid long lines in the cafeteria or elsewhere.

Invitational Sampler

Tap parent power. Many school programs can use parents or other volunteers as resources. Volunteers can fill many roles, including tutoring, typing, filing, monitoring, grading, chaperoning, even teaching mini-courses. Most communities have volunteers available. They only need to be invited.

are not only aware of the importance of programs within their own institutions but also are informed about programs in the larger community. There are dozens of community-based programs, from free dental work to free eyeglasses, from Big Brother to United Way, any of which can contribute to the welfare of students in schools.

People

People-oriented schools are easy to identify. They are the ones where doors are unlocked early on frigid days so that students do not have to stay out in the cold. They are the ones where the faculty call students by name, where courtesy and civility are the rule, where there is a general atmosphere of warmth and respect.

Places, policies, and programs are all important aspects of invitational education, but people come first. If places, policies, or programs directly or indirectly inconvenience people or inhibit their development, they should be altered wherever possible. People develop best in an inviting environment.

Increasing Your Invitational Quotient

By this time you, the reader, might be thinking: "All this sounds good in theory, but does it work in the real world?" The authors agree that invitational education is easier to talk about than to do. Of course, the real test is whether it can be implemented with a long-term plan for action. Invitational education offers such a plan. It enables educators to become committed to an enduring project, not unlike the commitment of the marathon runner.

Suppose you decided to run a marathon—26 miles, 385 yards. Chances are, if you knew nothing about running a marathon, you would show up on the day of the race dressed in street clothes and out of condition. When the starting gun sounded, you would start running full speed. And if you made the first mile, it would be a miracle.

Marathon runners orchestrate a plan for running a good race. They train properly, they modify their diet, they develop a support group of other runners—all as part of their race plan. They learn how to sustain their energy, and they develop an I-can-do-it mind-set, both of which are necessary to complete this grueling physical task. The same is true of educators who subscribe to the concepts of invitational education. They have a systematic plan for orchestrating their efforts in making schools inviting.

This plan for invitational education is called the "Four Corner Press." The four corners include: (1) being personally inviting with one's self, (2) being personally inviting with others, (3) being professionally inviting with one's self, and (4) being professionally inviting with others. While these corners are simple to describe, they are not easy to implement. The goal is to balance the demands of the four corners and to orchestrate ways to blend them together.

Being Personally Inviting With One's Self

For the invitational education model to succeed, it cannot be restricted to working only with others in

offices and classrooms. The invitational model is not a hat to put on at the beginning of the school day and take off when leaving for home in the evening. It begins with being personally inviting with one's self. The personal messages one sends to one's self are critically important.

To be personally inviting to one's self, there are two types of invitations one can extend to one's self: to live life fully and to use quality "self-talk." Educators have a special responsibility to have lively and interesting lives. If educators are bored, they are probably boring other people. Invitational education encourages educators to stand tall, walk proud, dress well, eat right, and do interesting things—all in order to have a positive presence in their own lives, as well as the lives of others.

Invitational Sampler

Treat yourself. Make a pledge to do something special for yourself in the immediate future. Treat yourself to a shopping trip, a new outfit, some quality down-time, a good book, a favorite meal, a play, movie, or other enjoyable event. Think of the nicest invitation you could send to another person, then send it to yourself. After all, you are always invited when you are giving the party.

In addition, educators need to engage in internal dialogue or quality "self-talk" as they go about their life activities. On occasions when a mistake is made, persons often will send themselves a powerfully disinviting message, one that they would never imagine sending to anyone else. Consider these examples of negative self-talk messages: "I have two left feet," "I could never lose weight," "I'm all thumbs," "I can never remember names," or "I couldn't carry a tune in a bucket." Negative self-talk demeans the individual. Instead, a person should try to make "self-talk" quality messages—ones that will nourish self-esteem.

Being Personally Inviting With Others

To develop fully, people require nurturing from others and should give nurturing in return. Each person needs to love and be loved throughout life. The recognition received from others for deeds small or large sustains and encourages each person to do more.

Students are keenly aware of the nuances in messages they receive in schools. In invitational education, teachers give consideration to students' feelings and interests. Sharing out-of-class experiences, making a special effort to learn students' interests, and expressing pleasure when the class has performed well are ways teachers can influence how students perceive themselves as learners.

Educators also need various kinds of personal invitations. Cultivating friendship is one form of invitation. Like cultivating a garden, friendships take time and effort. However, they can be one of the most significant ways of celebrating life, be it sharing a meal or a drink, or remembering a birthday or anniversary. Inviting relationships affirm both parties.

Invitational Sampler

A person's name is a most important possession. Using a person's name signals that you have taken the time to learn the name correctly. When you are first introduced to people, listen carefully and repeat their names to yourself three times. Then use the names as you speak to them. The recognition of their names will not go unnoticed.

Invitational Sampler

Remember the Rule of Four. You are violating the Rule of Four when you spend too much time doing paperwork or other chores that someone else could do with only four hours of training. Using volunteers and paraprofessionals is an effective way to cut down on a heavy workload.

Being Professionally Inviting With One's Self

Living in a rapidly changing society and profession can be both exhilarating and exasperating. If people stand still in their professional development, they lose ground. Thus, every educator has to become a lifelong learner and an explorer of new professional frontiers.

Lifelong learning is often stressed in education circles. It tells educators to keep their blades bright and not to rust on their laurels. In practice, lifelong learning involves reading professional texts and journals, writing for professional publications, joining professional groups, and participating in professional conferences. Piloting a new curriculum, participating in a teacher exchange, or traveling in a foreign country are just a few of the ways to be professionally inviting with one's self.

Invitational Sampler

Carpool an adventure. If an important conference, a noted lecturer, or a training workshop is scheduled in a nearby city, join with your colleagues, pool your gas money, and attend as a group. Enjoy the companionship going and coming; and while there, pick up brochures, handouts, and good ideas to share when you return home

Invitational Sampler

Make the phone your ally. The telephone is your conduit to your community. Parents and others can learn a lot about your school by a simple phone call. And do not restrict your calls only to discuss problems; share the good things that are happening, too. When answering a phone, make the caller feel welcome. Saying, "Good morning, Jackson High School, Bob Brown speaking" is far more inviting than simply answering, "Jackson High School."

Being Professionally Inviting With Others

Being professionally inviting with others is best accomplished by building on the opportunities provided by the previous three corners. Once the first three corners are functioning smoothly, they serve as a foundation for the fourth corner.

Two ways to be professionally inviting with others are to communicate clearly and to evaluate fairly. Communicating clearly involves emphasizing positive behavior. For example, "We have five minutes left, and it is important that we finish on time" is much clearer and positive than, "If you don't finish on time, you will have to stay after school and finish." Communicating clearly spares people the trouble of trying to read the speaker's mind.

Evaluating fairly means treating people equitably. To be professionally inviting with others, educators must guard against differential treatment. In classrooms this means finding ways to invite students each day. When carrying out a school policy, it means that people perceive the policy as being inherently fair and appropriately administered.

The four corners of invitational education described here are essential to successful personal and professional functioning. Educators who are able to orchestrate these four corners into a seamless whole are on the way to invitational living.

Conclusion

In this paper the authors have explored the process of inviting school success. By focusing on the pervasive and often subtle messages extended and received in the school environment, the authors have tried to point out familiar and often simple things that invite school success but are often overlooked. In *The Wizard of Oz* the witch tells Dorothy, "You cannot miss the road to the City of Emerald, for it is paved with yellow brick." But Emerald Cities, like inviting schools, can sometimes be too obvious to see. When Dorothy was lamenting that she would never get back to Kansas, the good witch Glenda reminded her: "Silly girl, you've always had the power, you just didn't *want* hard enough." So it is with schools. If enough educators want hard enough to create and maintain inviting schools, then they will come about. As Dorothy said when she finally got back to Kansas, "Oh, Aunt Em, I've been to many strange and marvelous places looking for something that was right here all along—right in my own backyard!" So it is with inviting school success.

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MAKING CONNECTIONS: Toward a Unifying Instructional Framework

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This paper explores connections between the need to develop the thinking skills of all students and each of four instructional approaches, including cooperative learning, direct instruction, invitational education, and learning styles. The authors continue their efforts to "make connections" by presenting an organizing framework for synthesizing these instructional models. Finally, implications for staff development practice are considered.

DURING RECENT YEARS educators have witnessed the emergence and proliferation of a number of educational movements having implications for instructional practice. Each of these instructional approaches has responded to identified educational needs and has provided specific pedagogical prescriptions for addressing these needs. Among the most prominent of these models are Cooperative Learning, Direct Instruction, Invitational Education, Learning Styles, and Thinking Skills.

The widespread dissemination of these models throughout the country has left practitioners both enthusiastic and confused. The enthusiasm is grounded in the recognition that each of the aforementioned approaches offers something practical and significant for teachers and students. The confusion lies in what may be referred to as the coherence problem. The coherence problem appears when two or more of these instructional approaches are introduced into a school or a district. Since these approaches vary in terms of goals, terminology, research base, and pedogogical features, practitioners are frequently left to choose from among them or attempt some measure of synthesis. In many school districts, the advocates of different models compete for favorite son status in terms of available funding, staff development time, and curriculum attention. At the classroom level, teachers are pressured by the differing instructional expectations of peers, department chairs or team leaders, principals, and supervisors. Comments such as the following are being heard more frequently by educators in various roles within school districts:

- *I'm interested in addressing student Learning Styles, but my supervisor expects me to follow a six-step lesson plan.*
- *I'm not sure how the techniques of Cooperative Learning fit in with our school focus on Critical Thinking.*
- *We're developing our district's long-range staff development plan. On which instructional models should we concentrate?*

With these experiences on the increase, it appears timely to explore the connections among the various models for the purpose of achieving a deeper level of understanding and

instructional integration. This paper seeks to contribute to this goal by:

1. exploring the relationship and connections between each of the following prominent models, **Cooperative Learning, Direct Instruction, Invitational Education,** and **Learning Styles,** and the efforts to develop the **Thinking Skills** of all students (see Figure 1);

2. examining one organizing framework for assessing and synthesizing various instructional models; and

3. considering implications for staff development practice.

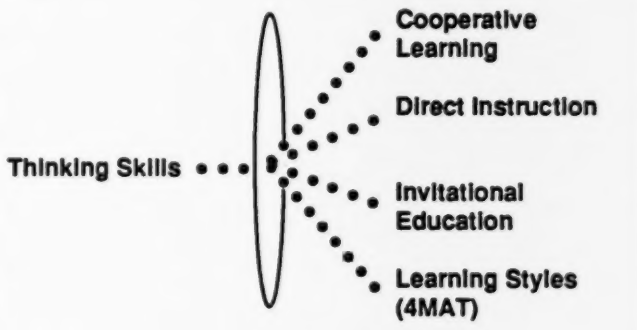


Figure 1
Exploring Connections

Thinking About Thinking

The goal of developing students with the capacity to think critically and creatively is certainly not new in education. However, renewed attention to this goal has been stimulated by a number of factors (McTighe & Schollenberger, 1985). For example, analyses of local, state, and national test results reveal that students have improved their performance on basic skills items but continue to experience difficulty in such areas as interpretive reading, persuasive writing, and multistep problem solving, which require more sophisticated applications of knowledge. In addition, changes in occupational patterns, increase in global economic competition, and the knowledge explosion have prompted employers, educators, and others to emphasize the importance of developing the skills of logical reasoning, critical thinking, and creative problem solving for the information age. Finally, contemporary models of learning emphasize the constructive nature of knowledge and point out that meaningful learning cannot occur without active intellectual engagement with new material. Nearly all of the educational reform reports produced in the 1980s have cited reasons such as these in their recommendations for an expanded view of the basics to include critical and creative thinking.

This current thinking skills movement is anchored by a number of fundamental assumptions regarding the nature of thinking and its development. These assumptions, as identified by McTighe (1985), are summarized below:

- The thinking abilities of all students can be developed through instruction.

- The improvement of thinking should be addressed throughout the grades and should begin in primary classrooms.

- Thinking is fundamental to all subjects and should be emphasized within each content area.

- Teaching for thinking promotes deeper understanding of content material.

- **Cooperative learning exchanges enhance the quality of student thinking and comprehension.**

- **Current standardized tests do not adequately assess student thinking abilities.**

Despite general agreement regarding the importance of developing student thinking abilities, no such consensus has been reached regarding the best way of accomplishing this goal. Some experts maintain, for instance, that good thinking results from extended dialogue and discussion, stimulated by thought-provoking questions. Others argue for more direct instruction in specific thinking skills. Some believe that the most effective means of developing better thinking is through writing, while others advocate attention to metacognitive strategies. Philosophers urge educators to cultivate the dispositions of good thinkers, such as the willingness to consider alternative points of view.

These diverse recommendations suggest that there is no single best method for developing student thinking. Rather, a number of complementary approaches should be utilized. Ron Brandt (1984), Executive Editor of the Association for Supervision and Curriculum Development, offers a useful framework for considering the various instructional methods for promoting thinking. He proposes that educators should be teaching for thinking, teaching of thinking, and teaching about thinking (see Figure 2).

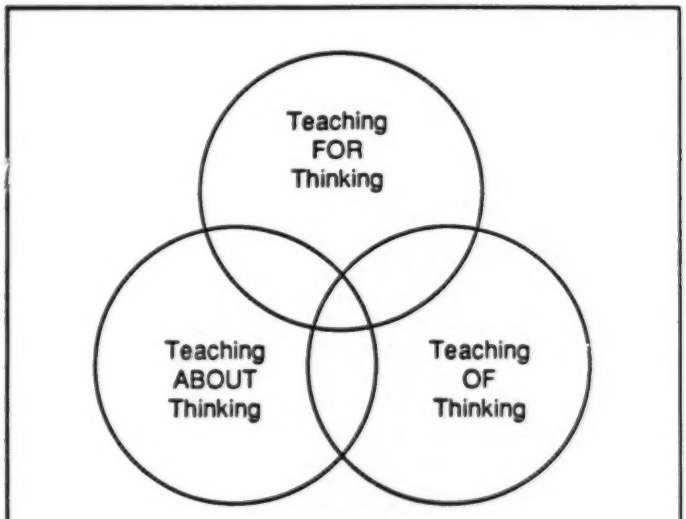


Figure 2
Framework for Promoting Thinking Skills

Teaching for thinking includes those teaching strategies that stimulate students to think, including a number of classroom activities that teachers have used for years, such as discussion, problem solving, debate, experimentation, simulations, interpretive reading, and writing. Strategies such as these provide opportunities for students to exercise their thinking abilities. However, they do not actually teach thinking.

The direct teaching of thinking is based upon the belief that effective thinking may not develop automatically as a by-product of other activities and, consequently, that a more explicit approach may be needed. The direct teaching of thinking makes a selected thinking skill, such as predicting, or a thinking process, such as decision-making, the focus of a lesson. The specific steps and strategies involved in applying the skill or process are overtly taught and modeled. Students are then involved through guided practice in using the skill in various contexts within the curriculum.

Teaching about thinking seeks to go further in making the invisible process of thinking visible through discussions with students about the thinking process itself. The goal in teaching about thinking is to help students become more metacognitive, or conscious of their own thinking, and

more aware of the strategies and dispositions of effective thinkers. The for, of, and about organizer is not an instructional model. Rather, it is intended to serve as a practical framework for analyzing different instructional methods designed to improve the quality of student thinking.

Cooperative Learning

Cooperative Learning may be broadly defined as any learning activity in which students of diverse backgrounds work together in groups toward a specified goal. Considerable research conducted in recent years substantiates the effectiveness of Cooperative Learning methods for promoting increased student achievement, improving attitudes toward school, and enhancing interpersonal relations (Johnson, Maruyama, Johnson, Nelson, & Skon, 1981; Slavin, 1981). Reports of such cognitive and affective results have sparked a growing interest in Cooperative Learning methods. Although various Cooperative Learning designs have been developed, the most effective approaches are united by their adherence to the following principles: **positive interdependence,** whereby the group's success depends upon the performance of each of its members; **cooperative reward structures,** whereby the group is rewarded for effective performance; and, **individual accountability,** whereby each individual is held accountable for his contributions to the group.

Cooperative Learning promotes the interactive processing of ideas and thus naturally complements other instructional approaches for developing student thinking skills. This natural fit is recognized by educational researchers, Joyce, Showers, and Rolheiser-Bennett (1987), who note that:

> Research into cooperative learning is overwhelmingly positive and the cooperative approaches are appropriate for all curriculum areas. The more complex the outcomes (higher-order processing of information, problem solving, social skills, and attitudes), the greater are the effects. (p. 17)

A number of Cooperative Learning designs are especially well suited to stimulating higher order thought. These designs include peer response groups for writing, group problem solving in mathematics, reciprocal teaching in reading, group investigations and experiments in science, discussions and debates using structured controversies in social studies and home economics, and collaborative projects in any content area.

In addition to the general benefits derived from student interactions, Cooperative Learning approaches contribute specifically to the development of student thinking in at least three ways. First, since group members are encouraged to share their knowledge, each individual has access to a larger pool of information about which to think. Second, collaborative group structures naturally provide opportunities for students to expand their own thinking by considering different points of view. Third, the articulation of strategies and reasoning within a group helps to render the invisible process of thinking visible for all participants.

Perhaps the connection between thinking and cooperation can best be summed up by the adage, "No one of us is as smart as all of us."

Thinking Skills and Direct Instruction

The Direct Instruction model emerged as an outgrowth of attempts

to synthesize principles of effective teaching into a practical pedogogical model. Direct Instruction emphasizes active teaching and student time on task. Elements of the model include explicit instruction in identified skills and concepts, guided practice with immediate feedback, frequent reviews and checks for understanding, and independent practice. A synthesis of classroom research (Rosenshine, 1976) confirms the effectiveness of these instructional elements in producing positive effects on student achievement. The need for a systematic instructional procedure linked to student achievement gains has led many educators throughout the country to enthusiastically embrace the principles of Direct Instruction.

How does the Direct Instruction model relate to efforts to improve the quality of student thinking? A cartoon by Sidney Harris (1978) provides a humorous insight into this relationship. In the cartoon, two professors are examining a blackboard filled with complex mathematical formulas. In the center of the board, amidst the calculations, is the phrase, "then a miracle occurs." One professor turns to the other, points to this section of the board, and comments, "I think that you should be more explicit here in step two!" This cartoon may be used to make the point that the miracle of good critical and creative thinking may not occur on its own for all students. That is, just asking students higher order questions does not ensure that they will have the thinking skills needed to answer them. Likewise, presenting students with a problem or a writing assignment does not teach the strategies employed by successful problem solvers or writers. And simply holding a classroom debate does not instruct students about how to effectively structure or rebut an argument. In each of these examples, a more explicit approach may be needed to develop the specific skills and strategies of thinking.

It is in this context that a Direct Instruction approach is valuable. Any identified thinking skill or process can be taught directly. To this end, Barry Beyer (1987) has identified the following six-step lesson model for introducing any thinking skill (see Figure 3).

Step 1 - Introduce the Skill

Step 2 - Explain the Skill

Step 3 - Demonstrate the Skill

Step 4 - Review What Was Done

Step 5 - Apply the Skill

Step 6 - Reflect on the Skill

Figure 3
Model for Introducing a Thinking Skill

In addition to this directive procedure, Beyer has also developed an inductive and a developmental lesson model for explicitly teaching such fundamental thinking skills as classifying, comparing, evaluating, hypothesizing, sequencing, and summarizing. Direct Instruction can also be applied to more complex mental processes, such as decisionmaking and problem solving. Other examples of explicit instruction include the process approach to the teaching of writing through which students are directly taught prewriting strategies of brainstorming and use of graphic organizers. Likewise, the contemporary view of reading encourages the direct teaching of comprehension monitoring strategies when necessary.

While a Direct Instruction model can certainly be productively applied to the teaching of thinking, several caveats should be mentioned. First, educators must be cautious not to fall into the reductionist trap, where dozens of micro thinking skills are drilled and practiced in artificial contexts without any bridging into meaningful content. Unfortunately, a

number of workbooks filled with such exercises are available and frequently utilized by well-intentioned teachers interested in teaching thinking skills. The research on transfer (Perkins & Salomon, 1988) points out that, in general, students do not spontaneously apply thinking skills learned in one situation to new contexts. Thus, the direct teaching of thinking skills must include overt attention to the transfer of newly learned thinking skills into various content areas as well as into real world, out-of-school contexts.

Secondly, as Lauren Resnick (1987) indicates, higher order thinking is more heuristic than algorithmic. While there may be certain identifiable elements involved in evaluation, argumentation, and problem solving, these thinking processes do not always follow a rigid, sequential series of steps. In addition, thinking is to some extent idiosyncratic, in that individuals employ different strategies for organizing information and solving problems. Teachers interested in teaching thinking directly must remember not to require all students to memorize the one, correct thinking procedure. Rather, they should take time to discuss the various ways in which students arrive at solutions, encourage students to reflect on their own thinking, and serve as models by reflecting on their own thinking process.

Thinking Skills and Invitational Learning

The foundational principles of Invitational Education emerged from research which correlated school achievement with the self-concept of learners. This research suggests a reciprocal relationship, i.e., students who display positive self-concepts are more successful in school while lower achieving students tend to have less positive academic self-concepts. Invitational Education advocates contend that the school and classroom environments influence student self-concept in ways that are relevant to academic achievement and that educators can intentionally create a more inviting environment in order to promote these positive effects (Purkey, 1970). As an educational model, Invitational Education is grounded in four fundamental assumptions (Purkey & Novak, 1984) regarding learners and the educative process:

1. People are able, valuable, and responsible and should be treated accordingly.
2. Education should be a collaborative, cooperative activity.
3. People possess untapped potential in all areas of human endeavor.
4. Human potential can best be realized by places, policies, and processes that are specifically designed to invite development, and by people who are intentionally inviting with themselves and others, personally and professionally. (p. 2)

An educationally inviting school and classroom would reflect each of these assumptions within its policies and activities.

A clear connection may be found between the principles of Invitational Education and the guiding assumptions and instructional practices of the thinking skills movement. Current efforts to improve thinking are grounded in the belief that all students can think and that the quality of their thinking can be improved through instruction. This fundamental assertion reflects evolving notions of human intelligence and its development (Feuerstein & Jensen, 1980; Gardner, 1983; Sternberg, 1984.) These contemporary theorists main-

tain that intelligence is a complex, multifaceted phenomenon that cannot be legitimately described by a single score from an I.Q. test. In addition they argue that intelligence is, at least to some extent, educationally modifiable through explicit attention to cognitive and metacognitive processes. The implications of these ideas have great significance for the nature of educational programming. For example, if one believes that cognitive abilities can be developed through instruction, then one must question whether thinking skills should be reserved primarily for the highly able. In fact, the results of such a reconceptualization are apparent on a national scale, as thinking skills programs, once the province of gifted education, are increasingly being advocated for all students. No longer is the notion of thinking skills for the gifted and basic skills for the rest a defensible proposition. Other connections between Invitational Education and Thinking Skills are evident at the classroom level. Considerable research has been conducted on the influence of teachers' expectations of students on their instructional practices (Brophy, 1983). These studies have shown, for instance, that teachers are less likely to call on low achieving students to respond to thought-provoking questions. In addition they provide these students with less wait time and fewer opportunities for elaboration, even though both of these techniques clearly influence the quality of a pupil's response. Such practices disinvite good thinking and help to reinforce both teacher and student conceptions of limitations.

A distinguishing characteristic of current programs to develop thinking skills is the attention given to metacognition. Metacognition may be generally defined as knowledge about, and control of, one's cognitive processes. Thinking skills instruction seeks to help students reflect on their own thinking and to become more strategic in planning, monitoring, and evaluating their mental performance. Metacognition also includes awareness of attitudes and dispositions, such as a student's conception of himself as a thinker. Recent research (see attribution theory, Weiner, 1983; and locus of control, Weinstein, 1982) suggests that one's motivation to perform is strongly influenced by one's belief regarding the extent to which he or she is in control and has the capability to succeed. If a student's self-concept as a thinker is poor (e.g., "I'm not good at solving math problems," or "I'll never be a good writer"), then he is unlikely to put forth maximum effort in such situations. Likewise, if a student believes that success is dependent primarily on luck, raw ability, or other people, then she may give up easily when confronted with intellectually challenging tasks. The concern of Invitational Learning for cultivating positive student self-concepts is crucial to the realization of the goal of improved thinking. One's self-concept is critically linked to the cultivation of important dispositions characteristic of effective thinkers, such as persistence, concern for accuracy, and the willingness and flexibility to try new approaches.

Finally, the critical influence of classroom climate is strongly acknowledged by advocates of Invitational Education and Thinking Skills. This influence is discussed in the book, *Dimensions of Thinking* (Marzano, et al., 1988), published by the Association for Supervision and Curriculum Development:

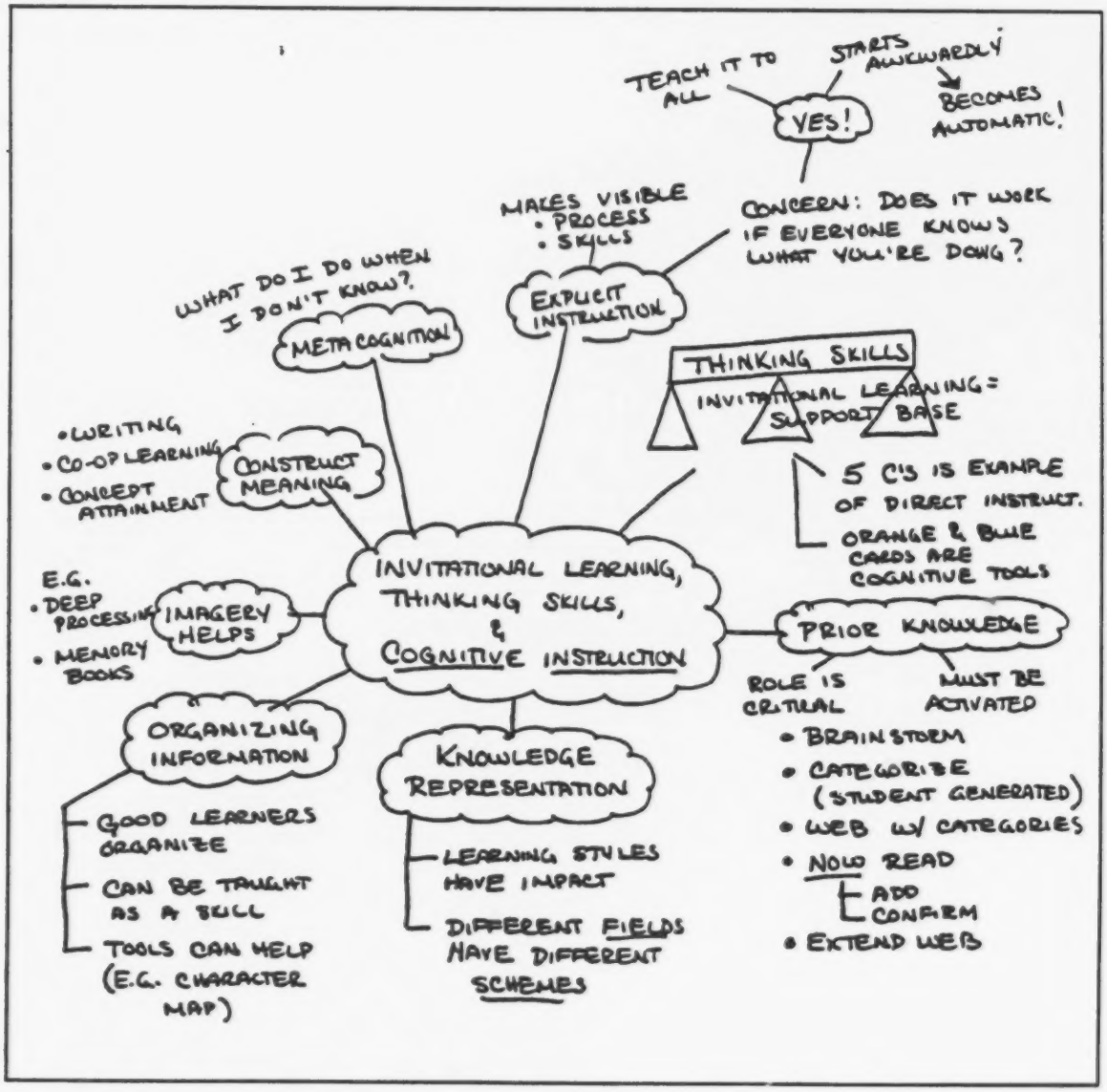
> Closely related to teachers' behavior is the development of a classroom climate conducive to good thinking...students cannot think well in a harsh, threatening situation or even in a subtly

> intimidating environment where group pressure makes independent thinking unlikely. Teachers can make their classrooms more thoughtful places...by demonstrating in their actions that they welcome originality and differences of opinion. (p. 31)

By embracing and actualizing the principles of Invitational Education, educators will be establishing the very conditions necessary for the cultivation of critical and creative thinking by students and staff.

Thinking Skills and Learning Styles

Learning styles, according to Joyce and Weil (1986), are important to

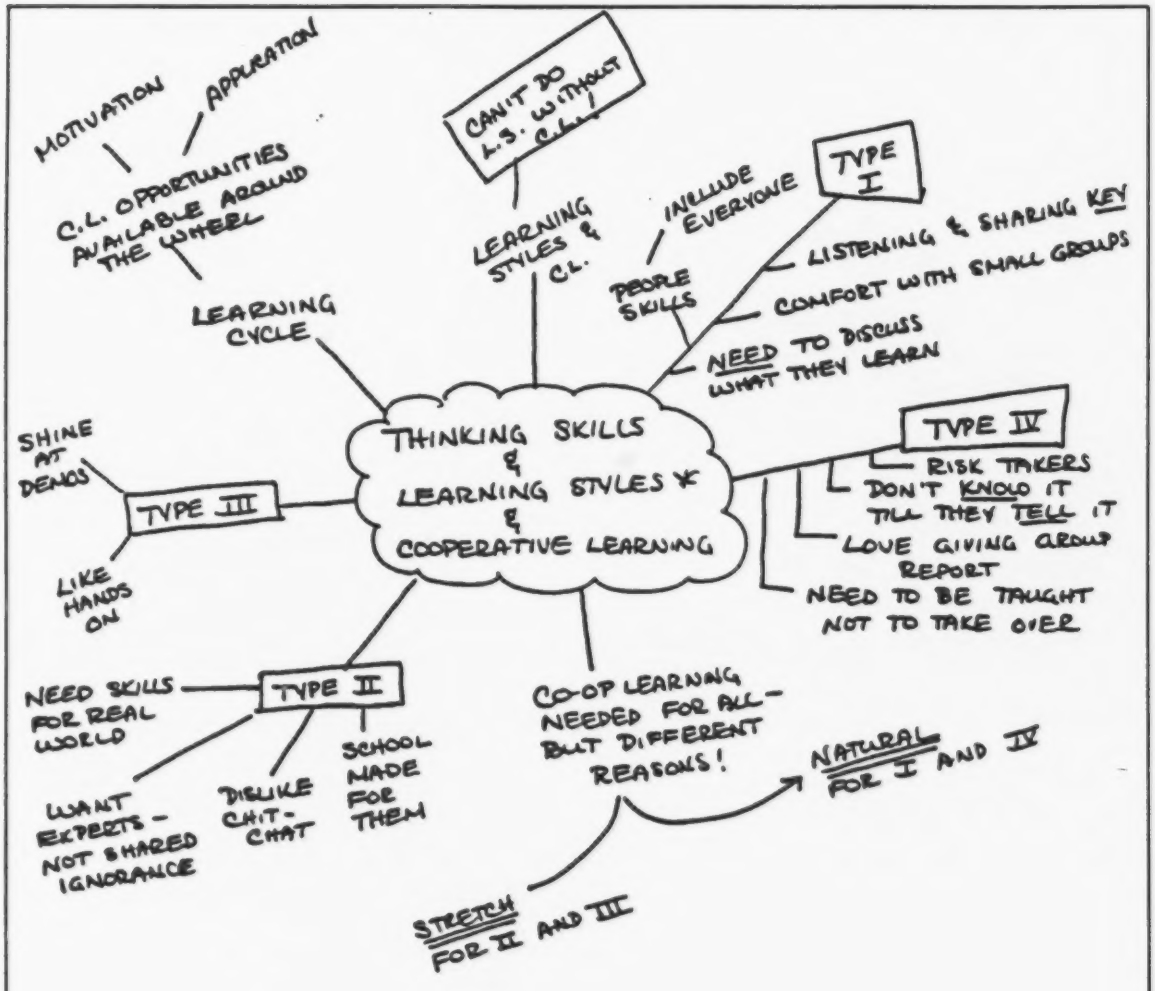


consider because they are the "education-relevant expressions of the uniqueness of the individual" (p. 435). Just as it is true that different learning environments affect students in different ways, it is also true that students bring to the learning environment diverse learning preferences. These differences may be described in terms of learning styles. Theories regarding learning styles build upon the theoretical work of Jerome Bruner (1960) and others who have attempted to explain a phenomenon that many teachers have understood intuitively, i.e., that students do not perceive and process information in identical ways. For example, some students prefer to have information presented in visual form while others are more comfortable with verbal stimuli. Some learn best through concrete experiences while others enjoy abstract conceptualization. To accommodate these differences in the classroom, a number of educators including Dunn and Griggs (1988); Gregorc (1985); and Silver, Hanson, and Strong (1987) have developed learning styles models. Currently, one of the most popular of these models is 4MAT (McCarthy, 1981).

Based on a synthesis of the theoretical and practical work on learning styles, Bernice McCarthy developed the 4MAT system, an eight-step cycle of instructional methods, which appeals to four major learning styles. The learning styles in 4MAT are **Type One** (innovative), **Type Two** (analytical), **Type Three** (common sense), and **Type Four** (dynamic). According to McCarthy, Type One learners ask the question, "Why?" They need to be given reasons. Type Two learners, on the other hand, ask the question, "What?" They seek facts which deepen their understanding. Type Three students ask, "How?" They need to be permitted to experiment and try things. Finally, Type Four learners' favorite question is, "If..." Teachers are advised to allow Type Four learners to teach themselves and others.

In order to be effective with all students, teachers must employ a variety of instructional strategies, because each of the four types of learners is more comfortable and successful with some modes of instruction than with others. Type One learners, for example, learn best through brainstorming and interacting, while Type Two learners prefer observing, analyzing, and classifying. Type Three learners excel at manipulating materials and ideas, and Type Four learners need activities which permit them to modify, adapt, and intuit. The optimal instructional program, McCarthy contends, provides opportunities for each type of student to be comfortable at least part of the time and stretched to develop other abilities the rest of the time.

The richness of the 4MAT model provides diverse opportunities for teachers to engage students in higher order thinking. According to McCarthy, students must be encouraged to reflect and analyze in order to optimize learning. This approach is consistent with experts such as Barbara Presseisen (1985) and Arthur Costa (1985), who stress the importance of metacognitive strategies as key to developing student thinking abilities. McCarthy's belief that the legitimate goal of instruction is to "lead students to self-discovery, not the regurgitation of facts and figures" complements the orientation of Thinking Skills advocates. Her model accommodates the direct instruction of such thinking skills as classifying, hypothesizing, and drawing conclusions. Proponents of thinking skills instruction also emphasize the need to provide opportunities for students to interact and collaborate, as well as analyze and reflect. The inclusion of


MOTIVATION
APPLICATION
C.L. OPPORTUNITIES AVAILABLE AROUND THE WHEEL
CAN'T DO L.S. WITHOUT C.L.
LEARNING CYCLE
LEARNING STYLES & C.L.
INCLUDE EVERYONE
PEOPLE SKILLS
TYPE I
LISTENING & SHARING KEY
COMFORT WITH SMALL GROUPS
NEED TO DISCUSS WHAT THEY LEARN
THINKING SKILLS & LEARNING STYLES * & COOPERATIVE LEARNING
SHINE AT DEMOS
TYPE III
LIKE HANDS ON
TYPE IV
RISK TAKERS
DON'T KNOW IT TILL THEY TELL IT
LOVE GIVING GROUP REPORT
NEED TO BE TAUGHT NOT TO TAKE OVER
NEED SKILLS FOR REAL WORLD
TYPE II
WANT EXPERTS - NOT SHARED IGNORANCE
DISLIKE CHIT-CHAT
SCHOOL MADE FOR THEM
CO-OP LEARNING NEEDED FOR ALL - BUT DIFFERENT REASONS!
NATURAL FOR I AND IV
STRETCH FOR II AND III

* LEARNING STYLES PERSPECTIVE

cooperative learning strategies in the 4MAT model appeals to Type One socializers, while providing all students with opportunities to work together in small groups and teams.

In sum, McCarthy's 4MAT system is structured to assist teachers in honoring the individuality of their students through the instructional methods and activities which they select. It provides a practical, student centered model which naturally complements instructional approaches for developing thinking skills.

Attempting To Put It All Together: An Organizing Framework

Attempts to analyze and synthesize diverse teaching approaches are assisted by the use of a common

instructional framework. One such framework has been proposed by a group of leading educators (Hanson, Marzano, Silver, Strong, & Wolfe, 1989). Their framework consists of five components acknowledged as important to the learning process and serves as an organizing construct for examining any instructional model.

Motivation - To what extent does this model utilize intrinsic and extrinsic approaches for motivating students?

Memory - In what ways does this model assist learners in storing and retrieving information in long-term memory?

Meaning - To what extent does this model involve students in the active construction of meaning? How is this accomplished?

Transfer - In what ways does this model teach and encourage students to productively apply knowledge in new contexts?

Metacognition - To what extent are students instructed in metacognitive strategies and dispositions?

By using a matrix design, different instructional models may be compared (see Figure 4). In addition, the framework may serve as a base from which a synthesis of models can be constructed.

Such a matrix could be developed using different learning variables on the vertical axis. Likewise, other instructional models, such as **Writing Across the Curriculum** or **Mastery Learning** could be inserted along the horizontal axis.

Implications for Staff Development

Teachers, like students, are a diverse population. Their differing teaching experiences and training programs have led to the development of unique teaching schemata. According to Arends (1987), teachers expand their instructional repertoires by integrating newly learned techniques into their existing "teaching schemata." The struggle that many educators are experiencing in attempting to integrate the different instructional models is similar to the process that students go through in trying to understand new material that they encounter in school. Schema theory asserts that new information and concepts must be integrated into one's existing knowledge structures, or schemata, for true comprehension to occur (Rumelhart, 1980). This view characterizes learning as an active, constructive process by which the learner links the new input with prior knowledge. Meaningful learning, therefore, requires that students go beyond rote memorization and become intellectually engaged with new material. They should actively think about and puzzle over new concepts in

	Cooperative Learning	Direct Instruction	Invitational Education	Learning Styles	Thinking Skills
Motivation					
Memory					
Meaning					
Transfer					
Metacognition					

Figure 4
An Organizing Framework

order to develop a personal understanding. Teachers, administrators, and supervisors confronted with various models are immersed in a similar intellectual quest. All seek to develop an expanded organizing schema to help make sense of the plethora of instructional options.

In order to facilitate a deeper level of understanding and integration, current staff development programs should include opportunities for experienced educators to actively explore the connections among various instructional models. Due to the idiosyncratic nature of an individual's teaching schemata, it is unlikely that a single integrated instructional model will be effective for every educator. Rather, the **process** of exploring and discussing these connections with other educators will contribute to the construction of a personal synthesis which is meaningful and accessible to the individual.

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Conclusion

The fact that there is now a rich marketplace of theories, models, and techniques of instruction is cause for celebration. The teacher in the classroom has many options for designing and implementing an instructional program to meet the needs of the diverse population of students in today's schools. However, the proliferation of teaching models is a mixed blessing. Today's teachers face the problem of idea-overload as new teaching techniques are introduced, and sometimes mandated, by school districts. Likewise, it is not uncommon for educational planners to feel overwhelmed by the multiplicity of instructional prescriptions that they encounter in educational journals and at conferences. In the language used in this paper, many educators have not had sufficient time to incorporate the various approaches to instruction into their instructional schemata. In some instances, the problems of overload and fragmentation result in frustration and cynicism on the part of practitioners at all levels, often expressed through a "this-too-shall-pass" attitude of passive resistance to new ideas.

In this era of potentially competing approaches to instruction, the need to take the time to actively explore the connections among various instructional models has never been more compelling. Mark Twain once commented that, "If the only tool you have is a hammer, you tend to treat everything as if it were a nail." In an instructional context, effective teachers do not adhere to a single, prescriptive teaching model. Instead, they make instructional decisions based on a mindful analysis of their objectives, the nature of the curriculum, the age levels and learning characteristics of their students, the available resources, and their preferred teaching styles (Berliner, 1988). Attention to "connection making" offers a promise of capitalizing on the diverse strengths of the various instructional models while actualizing the concept of teacher as decisionmaker .

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Evaluation Results

Three methods were used to evaluate the impact of the symposium, "Making Connections." Evaluation methods included participants' informal feedback to the evaluator during the symposium, a written evaluation completed immediately after the symposium (75 persons completed this, for a response rate of 30 percent), and another written evaluation six weeks after the symposium (89 completed this, for a response rate of 36 percent).

Attainment of Objectives

Evaluation results will be examined in terms of symposium objectives. These objectives are listed below:

- Provide a symposium to discuss a new instructional system which combines the methodologies of Invitational Education, Direct Instruction, Thinking Skills, and Learning Styles.
- Initiate a dialogue among proponents of these four methodologies.
- Provide attendees with information about the four methodologies.
- Help attendees understand the relationship among these methodologies.

The degree of attainment of each objective will be examined individually, with participant responses included as appropriate.

Objective No. 1: Provide a symposium to discuss a new instructional system which combines the methodologies of Invitational Education, Direct Instruction, Thinking Skills, and Learning Styles. Twenty-one (21) percent of respondents felt this objective was completely met, and 66 percent felt the objective was met to a large extent. Several respondents noted that the type of discussion described in this objective was especially pertinent to current issues in education. Twelve (12) percent of respondents felt this objective was met to some extent.

Objective No. 2: Initiate a dialogue among proponents of these four methodologies. Thirty-four (34) percent of respondents felt this objective was completely met, while 49 percent agreed that this objective was met to a large extent. The symposium's unique program organization, which contributed to the attainment of this objective, was cited in one evaluation as a strong point of the symposium. The remaining respondents (17 percent) felt this objective was met to some extent.

Objective No. 3: Provide attendees with information about the four methodologies. Twenty-four (24) percent felt this objective was completely met. Sixty-five (65) percent felt it was met to a large extent. Ten (10) percent felt it was met to some extent, though one person felt it was not met at all (since "attendees were not given the opportunity to hear all presenters").

Objective No. 4: Help attendees understand the relationship

among these methodologies. According to 17 percent of the respondents, this objective was completely met. Fifty-six (56) percent felt that it was met to a great extent. One strength of the symposium cited by respondents, the interaction between the presenters and the panel, relates to successfully meeting this objective. The remaining respondents, 27 percent, felt the objective was met to some extent. Overall, respondents felt this objective was met to a lesser extent than other objectives (on a scale of 1 to 4, this objective fell just short of 3, the only objective to do so).

Related to this fourth objective, visual notetakers at the symposium attempted to describe connections between methodologies and promote creative thinking among presenters and participants alike. (For more detail on mindmapping, see the first section of this occasional paper.) The mindmaps developed at the symposium and included throughout this paper show, in some cases, a relationship between specific methodologies. However, feedback from attendees indicated mindmapping was most helpful in clarifying and focusing the main ideas of each presenter, rather than in noting connections between presenters.

Twelve (12) percent of respondents expressed disappointment at being unable to attend each of the individual presentations. In one respondent's words:

> Because the initial presentations were scheduled so that only two could be attended, I missed...some valuable content that would have helped me make more connections in the following sections.

This discomfiture with what seemed to some to be an inadequate grounding in all methodologies, however, did not impact educator ideas for followup activities or use of materials.

Followup Activities

Suggestions made immediately after the symposium for followup activities were varied. A majority of the respondents supported the idea of scheduling another symposium of this type, perhaps even on an annual basis. Several respondents noted that the videotapes made at the symposium would be useful in student teaching and teacher staff development. The master copies of these videotapes will be available at the library at Radford University. Participants felt the videotapes could be a helpful resource for university faculty and students, as well as for faculty in the local schools.

On the average, respondents used or planned to use symposium ideas, materials, and information in at least two different ways. Respondents selected options in the following order of frequency:

- informal sharing with other teachers or staff,
- faculty/staff inservice,
- additional reading about any of the four methodologies,
- contacting presenters for additional information, and
- contacting/networking with other attendees.

While only 8 percent of respondents used symposium materials in ways other than the options listed immediately above, Table 1 below includes all of the ways respondents have used or planned to use symposium ideas, materials, and information. Perhaps this list will suggest additional ways readers can make connections between what was learned at the symposium and what can be applied on the job.

TABLE 1
Respondent Use of Symposium Information

Help students with mindmapping as a way of notetaking.

Used Purkey's material for a staff inservice on being inviting (blue) personally and professionally—complete with blueberry muffins!

Did a study skills session using mindmaps.

Mapping; webbing.

Implementation of programs in our county.

Sharing ideas with parents.

In college courses I teach.

Share with fellow administrators.

Similar conference held within our own school division and presented by our own personnel.

The Staff/Development focus for 1989-90 will be on student achievement, which is our division's mission. Next year, we will involve Invitational Education and 4MAT.

Use in teacher education courses.

Sharing with other principals.

Actually using some of the ideas in my class.

Incorporate concept in statewide staff development.

Information for our expanded Curriculum Resource Center.

Shared with School of Education faculty and with both graduate and undergraduate students.

A local research project dealing with learning styles of middle school students "at risk" has benefitted directly from the 4MAT materials.

Dropout intervention—alternative education strategies.

Taking immediate steps with Invitational Education ideas.

Sharing Symposium Information

Respondents indicated that they shared symposium information or materials with approximately 1,700 persons. This number suggests that—on the average—*each one* of the 89 respondents shared symposium information with 19 other persons.

Summary

Overall, respondents were extremely pleased with the symposium. They were interested in exploring the concept of making connections, and they felt the symposium was successful overall in attaining its objectives. One measure of symposium success was their decision to use symposium information and share it with others. Not only did respondents adapt symposium materials in a variety of creative ways, but they also shared these ideas, information, and materials—on the average—with 19 other persons.

Making Connections: Reflections on Beginning the Synthesis

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This paper serves as an epilogue to the symposium experience. The author notes connections that were made, as well as questions that were unanswered, at the symposium. Suggestions for beginning a synthesis are presented, including a proposal for more closely matching professional development activities to the needs of educators.

AN EDUCATIONAL SYMPOSIUM such as *Making Connections* often leaves participants with more questions than answers. Indeed, that is the desired effect as educators start considering unexplored ideas that will lead to theories of teacher behavior, or more importantly, models for improving student outcomes. This symposium left participants, presenters, and conference organizers with the feeling that they have only begun to address a problem that staff developers have long recognized, and one that may best be defined by posing several questions:

> How do educators synthesize teaching methodologies into an instructional system?
>
> Is there a way to view teaching that incorporates evolving research while maintaining proven models of instruction that have been successful in creating a match between teacher behaviors and instructional goals (identified through student outcomes)?
>
> Is there a better way to help teachers develop their skills and become cognizant of new information other than giving them information about and practice in various methodologies independent of each other?

These questions remind educators that teachers are often overwhelmed with the amount of new information staff development programs offer each year. As McTighe and Clemson have stated earlier, practitioners have a coherence problem. A principal, a supervisor, and a subject area specialist may each favor a different approach to teaching, providing inservice training as well as expecting some form of implementation during any given year. Teachers may be confused or they may simply lose interest, waiting for the next wave of inservice, the next topic of the year. Rarely do teachers have the luxury of taking the new information and reflecting upon it in any organized fashion. Traditionally, staff developers have not had access to groups of teachers for long enough periods of time to facilitate a synthesis of information.

The discussion that occurred during *Making Connections* is an example of the next step staff developers can take. In addition to obtaining new information about someone's instructional model, and in addition to identifying the attributes of the model and analyzing its utility, educators can begin synthesizing information about models—finding ways different approaches work together and identifying times when one model is more appropriate than another.

During the symposium, this process began. Presenters Jay McTighe, Susan Morris Leflar, William Purkey, and Doug Carnine each pointed out ways in which his/her methodology could be tied to one or more of the others. As a group, the presenters began seeing how these four well known methodologies could fit together in a classroom to solve problems associated with the cognitive and affective domains of learning. In addition, the symposium attendees made their own connections as they listened, questioned, mindmapped, and began synthesizing the information for themselves. Those who participated in this conference were able to practice what classroom teachers are told to do—operate at higher levels of thinking. Instead of attending a conference that conveyed new information or built upon existing information, this symposium focused on well known, frequently published ideas. Rather than taking a topic or model and analyzing it in detail, an opportunity was given for real synthesis, both by presenters and participants. For perhaps the first time, educators could think about differing perspectives on teaching with the goal of integration toward synergy.

An experience such as this symposium is valuable only if it stimulates people to think about things differently than they did before the experience. This section will attempt to capsulate some of that thinking, so that the symposium experience is not lost. In addition, this section encourages all who participated in the symposium to continue making connections among teaching methodologies and to continue looking for better ways to share information with teachers. Summarized below are (1) concepts learned during the symposium; (2) questions unanswered at the conclusion of the symposium; and (3) ideas suggested for followup to the symposium.

What We Learned—Connections Made

During the symposium, all four presenters had the opportunity to present with each other. (See Appendix A for a copy of the condensed agenda.) The presenters did not know each other prior to the symposium, but some were acquainted with the work of the others. While theme sessions allowed each pair of experts to share prepared comments with the participants, the unprepared, spontaneous comments were the most interesting to the participants. All shared in the metacognitive experience. Attendees observed each presenter reflecting, thinking aloud, hypothesizing and testing, and reasoning as he/she responded to comments made by the co-presenter. It was in the sessions where all four were together that the differences, similarities, and possibilities were most evident.

The panel discussion allowed Carnine, McTighe, Leflar, and Purkey the opportunity to respond to global questions as well as specific questions. Four of the questions asked deserve repeating. While they were not narrow in scope and could not be fully answered in a few minutes, responses generated gave insight into the similarities and differences in presenters' approaches, and, to a lesser degree, differences in their methodologies. (Questions and answers are shortened and paraphrased in some cases.)

Thomas Bentson, who represented the Virginia Association for Supervision and Curriculum Development (VASCD) and the local school perspective, asked:

> *What are the critical, fundamental principles of teaching that you would like teachers to follow each day?*

Leflar (Learning Styles)

There are three things every master

teacher must have: (1) content—the teacher must be a content specialist and know his/her material; (2) pedagogy—the teacher must understand the nature of learning and the learner; and (3) orchestration—I'm not sure you can teach this one, but when you're good on your feet, it blends.

Carnine (Direct Instruction)
(1) Every child is doing the best he/she can. (2) Every child can succeed. (3) I'll find a way to help that child, or I'll find somebody else who can.

McTighe (Thinking Skills)
Meaningful learning requires active processing of information. Let's give students the cognitive tools for active processing.

Purkey (Invitational Education)
Let's tell teachers, "You're beautiful. Go out there and enjoy yourself!"

Dr. Bentson also asked:
What should be our objectives for instruction?

Carnine
Our goal should be to make shorter lists, not longer lists, for curriculum development.

Leflar
I agree. We need global unit objectives. Teachers need to conceptualize and articulate to reach these shorter lists.

McTighe
We can't cover it all in this information age. What important processes do we want to cover to be sure students can handle new information we can't cover in school?

Purkey
(1) People are able, valuable, and responsible and should be treated accordingly. (2) Education should be a collaborative, cooperative activity. (3) People possess untapped potential in all areas of human endeavor. (4) Human potential can best be realized by places, policies, and processes that are specifically designed to invite development, and by people who are intentionally inviting with themselves and others, personally and professionally.

Edward Sutphin supervises elementary administration in Virginia's Department of Education. He asked three of the speakers:
How do we improve schools and schooling?

Carnine
Start small and build slowly. Set up model classes and follow them through school, beginning with kindergarten and first grade, using a developmental approach rather than a remedial approach.

Leflar
Think big, start small. Don't mandate change. Change occurs when (1) a strong leader articulates the vision; (2) some discrepancy is noted; (3) committed volunteers assist during change; (4) peer coaching occurs during change; and (5) special training for administrators accompanies the training for teachers so that administrators can support teachers.

McTighe
Provide an intelligent environment in the classroom for students and an intelligent environment in the school for teachers, which includes collaborative problem-solving.

Roanoke City School Superintendent Frank P. Tota reflected the concerns of many school administrators:

Is there an organizational pattern which best suits making connections?

Purkey

Invite teachers to the vision of connecting methodologies.

Leflar

Tie together your staff development programs—map it out for teachers. You can't do 4MAT without Invitational Learning (a safe place); you can't do 4MAT without Thinking Skills (incorporated in program); you can't do 4MAT without Direct Instruction (fits in all around 4MAT wheel). Tell teachers to make their own connections so they'll own the connections.

Carnine

Educate teachers about models. Then negotiate a synthesis: What are the teachers willing to do? Let them work on it and free them to observe other teachers. Then renegotiate how to make connections. That's how they come to see the vision.

McTighe

Build on the vision idea: What is the purpose of schooling? What assumptions do they have about learners? What are their specific goals for content and process? Staff development has two qualitatively different goals: (1) to enlarge the repertoire of teachers so they have knowledge of different strategies and can do a better job; and (2) to facilitate decisionmaking in the expert teacher who considers his/her goals and the characteristics of the student and then chooses the best strategy.

The connections that were made at this conference varied from individual to individual. However, there were some insights shared in sessions and afterward by the presenters that can serve as the basis for continued discussion and followup.

The presenters agreed that **the classroom must be an inviting place before any other method or approach to teaching is successful.** As Leflar said, "You can't do 4MAT without Invitational Learning." Carnine quoted Kleinfield in his paper, stating that the first and most important aspect of effective teaching is the teacher's ability "to create a climate of emotional warmth that dissipates students' fears in the classroom." After the symposium, Carnine said that one of the things he took home from the symposium was the reminder that a positive outlook is important in the classroom.

Another connection made during the conference was that **a problem or discrepancy should be noted before adopting a new instructional approach.** Both Carnine and Leflar stated that movement to their methodologies is unnecessary if a school's instructional program is working. "If problems are not being solved, look at Direct Instruction. When a teacher doesn't know what to do, look at Direct Instruction," Carnine stated. During the symposium, Leflar told the story of a successful school system that offered 4MAT training to the staff and found that the staff loved the training experience and enjoyed learning about 4MAT. However, no one in the school implemented the program, as the staff saw no need in their program for 4MAT—there was no discrepancy in students' abilities and their learning outcomes. This supposes another connection by inference: **If the administration recognizes the need to implement a new strategy to**

solve a problem, administrators should share the problem with the teachers so that everyone understands the need for change. This kind of understanding comes about through collaborative problem-solving. Whether implementing a Direct Instruction model or attending to learning styles differences, it is only after teachers have processed for themselves the steps that lead to the decision for change that they own the commitment to change.

As the symposium moved into the second day, participants observed the speakers becoming more at ease with each other and more able to start noting connections. In the sessions that focused on cognitive instruction, this was evident. At one point McTighe returned to his overhead transparency and showed co-presenter Purkey exactly where Invitational Education fit into his thinking skills model. At the same time in another room, Carnine acknowledged to co-presenter Leflar that Direct Instruction does not provide the extension of lessons for various types of learners (e.g., providing more detailed information or varying the scope of instructional materials for learners who quickly grasp the material). As Carnine continued to think aloud, he wrestled with the fact that students who need Direct Instruction are those who are two years behind when they enter school. Because of this, he did not know whether educators have the time to provide the extension that 4MAT supplies. After the symposium, Carnine noted that his exposure to learning styles research was valuable, and that **what students are learning through Direct Instruction can be extended if educators attend to student learning styles.**

Throughout the symposium and in discussions afterward, the presenters voiced a strong plea for **more teacher collaboration.** Purkey said that we must ask teachers to be a part of any effort for change. The idea is to "share the vision." Leflar and McTighe echoed this belief throughout the symposium. They both said that teachers must construct their own synthesis of teaching options. "If you're really interested in the teacher as decisionmaker," McTighe summarized, "staff development must move beyond giving people more stuff." He stressed that staff developers must structure and encourage more sessions that enable teachers to discuss problems and alternatives, so that they can make their own connections and develop their own plans for classroom improvement.

Carnine was more specific about ways to enhance making connections. He remarked that it is more like negotiating: finding out what teachers are willing to do, training them to do it, and giving them opportunities for peer coaching. Then administrators should let teachers come back and begin talking again about what teachers are now willing to do. Carnine added that schools that are serious about making connections and whose administrators have participated in this symposium could now begin working collaboratively to implement two or more of these methodologies. "Look at what's manageable," he cautioned. Changes could then be implemented sequentially over time. Carnine consistently reflected his belief that changes must "start small and grow" if changes are to be successful.

Leflar confirmed the positive outcomes of collaboration by commenting on the symposium experience itself. She stated that the experience of working with the other presenters in an open forum, where people were not "selling their wares,"—real collaboration—was one of the most exciting, stimulating, and affirming professional experiences she had

encountered. Her enthusiasm and interest in pursuing activities that may follow the symposium give evidence to the power of collaboration and support to the notion of designing unconventional, open-ended collaborative staff development ventures.

Unanswered Questions

The movement toward a synthesis of the four methodologies was a goal of the *Making Connections* symposium. The effort to integrate the models and determine baseline connections was demonstrated throughout the symposium by the four presenters. Connections left to be made or questions left unanswered were not unexpected after only a two-day exploration into the methodologies.

During followup activities yet to be planned by sponsoring agencies or designed by participants or presenters, unanswered questions should be explored. Questions remain that, while specific to one methodology, offer enlightenment upon the large arena of instruction. For example, this question prepared by Sutphin for Carnine deserves attention:

> *After two decades of research and application of Direct Instruction models, there continues to be a decline in national assessment scores, including SAT, ACT, etc. Does this indicate that we are on the wrong track with intervention strategies, or is the cure worse than the disease?*

Other questions that should be posed to proponents of each model represented suggest additional areas where connections should be made. Frank Tota left the symposium still curious about the type of teacher who can integrate various teaching styles:

> *Is there a blend of cognitive and intuitive styles of teaching which must be brought to bear here—the science and the art of teaching?*

Some issues that were raised during the symposium were not satisfactorily addressed. Judy Englehard from Radford University sought help from the presenters in designing teacher education programs that incorporate exposure to a variety of methodologies as well as pedagogy. A solution to this problem was not found. After some connection making, AEL's Jane Hange asked to restate one of the questions she put to the panel, for she believes it reflects what may be one of the most troubling dilemmas of the conference's main construct:

> *How can teachers, especially the often inexperienced teachers of at-risk students in urban settings, be expected to incorporate four new strategies to their existing repertoire and to choose and implement the appropriate strategy for each instructional situation?*

It is important that questions such as these continue to be posed to proponents of specific methods of teaching. Local educators as well as educational theorists want to know how to translate theory into practice.

Appropriate Followup to the Symposium

Several suggestions have been made regarding ways in which the ideas generated before, during, and after the symposium can be further considered. McTighe suggested expanding the synthesis to other models through the vehicle of a second symposium. Purkey agreed, suggesting both the area of Assertive Discipline and the Association for Humanistic Education as possible sources for speakers. A conference participant

suggested Motivation as another area that needs consideration. It is clear that the notion of synthesizing various methodologies is desirable and that an effort to bring this about should be continued.

However, before entering into new dialogue among representatives of other methodologies, some framework should be developed to continue the synthesis of the four areas addressed in this symposium. In their paper, McTighe and Clemson have suggested a matrix that organizes the methodologies (including cooperative learning) into a framework that allows readers to begin thinking about models in an organized fashion. McTighe believes that the next step for symposium participants is to find such a framework or organizer that will facilitate continued synthesis and integration of the models. If such an organizer can be found, the inclusion of additional methodologies to the synthesis will be manageable and of great use to staff developers and teacher trainers.

Another way of organizing the information learned from the conference focuses less on the different models and more on the maturity of the teacher. Throughout the symposium attention was given to the value and importance of including teachers in the synthesis effort. Emphasis was placed on allowing teachers to reach their own synthesis of these and other methodologies so they could match the needs of learners with the strategies offered in various approaches. Mention was made of leading teachers through this process in a developmental way.

Hersey and Blanchard (1982 and 1984) have developed a model of situational leadership that may be useful in reorganizing training in instructional models. Typically, staff developers identify one or two areas of focus for a school year and target certain teachers for training. These teachers may be in the same school, share the same subject area, or be participating in a school improvement project. Rarely is the training in any particular model matched to the developmental level of the teacher.

Hersey and Blanchard would have leaders (staff developers) provide activities for the followers (teachers) based on the teachers' maturity levels. For example, the first-year teacher, who is unskilled as a practitioner and insecure about his/her performance, would need training in the methods that are considered most basic in the classroom. As this teacher moves along the maturity scale (see Figure 1) and becomes more confident and more able to demonstrate the competencies associated with good teaching, he/she would be introduced to more complex models that build upon or assume

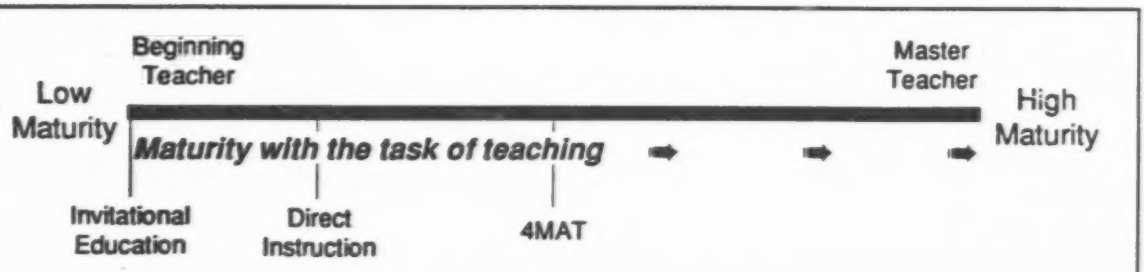

Figure 1
Teacher Maturity and Professional Development

competency in models introduced earlier. If staff developers could design activities around the maturity level of teachers as well as the needs of the school, a teacher would become familiar with a variety of teaching strategies as he/she became ready to use them in the classroom. In this way, the teacher would move toward the mastery level with the knowledge of a wide range of techniques and could choose the appropriate teaching strategy, including those learned in the beginning years, readily.

The connections made during the symposium indicate that three of the four methodologies can be placed on a continuum. The presenters agreed that Invitational Education is a prerequisite for other models' success, and that Direct Instruction skills must be mastered in order for a teacher to be successful with 4MAT. If each methodology could be placed on such a continuum, staff developers could better match these and other models to teacher needs. Based on the information discussed during the symposium, it is not easy to place Thinking Skills on this continuum, partly because this area is still evolving and partly because thinking skills occupy a part in other methodologies. Until a better framework for grounding the theory of Thinking Skills (and other methodologies) is explored, this continuum cannot be completed.

The value of viewing these and other methodologies on a continuum that matches teacher maturity is strictly utilitarian. School districts do not have the resources to offer a wide range of staff development activities annually to each teacher. Most school systems focus on one or two trends or models for a few years and then move on. Some teachers become highly skilled in a model, others do not. If staff developers could determine which teaching skills or models teachers need at a particular point in their professional development, the job of staff development would be much more rewarding. For example, a district could provide inservice activities that focus on Invitational Education for teachers just beginning their careers, as well as for teachers who are experiencing burn-out and need support. Then as teachers demonstrate an inviting attitude, attention could be given to a model such as Direct Instruction. Those teachers who master the skills of Direct Instruction would be exposed to the other methodologies, such as Learning Styles models, that build upon the skills of Direct Instruction but which require a certain level of confidence and instructional experience. Organizing a staff development program in this way would match teachers to the kind of methodological training they need, without asking experienced teachers to revisit Direct Instruction strategies or without asking beginning teachers to demonstrate the complex skills needed to accompany the pedagogical foundation of programs like 4MAT.

Conclusion

In February of this year, public school and university educators asked four well known teacher trainers to join them in a staff development experiment. The purpose of the experiment was to determine if educational leaders could engage in the process of synthesis in a conference setting. More specifically, could four outstanding leaders from four divergent methodologies in education work together successfully, in front of 250 local school and university educators, to begin integrating their approaches into one instructional system? Could a psychologically safe environment be provided that would encourage an examination of the four methodologies so the weaknesses and

strengths of the methods would emerge during this synthesis? Could people who had never worked together, who in some cases did not even know the work of the others, be placed in a public setting and feel comfortable truly examining the theory upon which their livelihood is based—all for the sake of improving staff development for local school teachers?

Making Connections was an attempt to break out of the traditional conference setting and move participants and presenters into higher level thinking. The symposium worked. Connections were made, educators started looking at these methodologies differently, and presenters found that working collaboratively with other teacher trainers moved them onto a different plane of stimulation and spontaneity.

The connections among the four methods discussed have begun, but a full exploration is needed. Ideas have been generated that may provide shape for possible followup activities and ongoing connection-making. Connections are yet to be made among the other respected and emerging methods and models in the teaching profession. While the symposium organizers did not expect to exhaust the possible connections among Direct Instruction, Learning Styles, Thinking Skills, and Invitational Education in two days, they wanted to begin the process of synthesis and hoped to find a model for initiating such dialogue. The symposium organizers are receptive to suggestions for followup activities and encourage all symposium participants to begin making connections in their own educational setting.

References

Hersey, P. (1984). *The situational leader.* Escondido, CA: Center for Leadership Studies.

Hersey, P., & Blanchard, K. (1982). *Management of organizational behavior: Utilizing human resources.* Englewood Cliffs, NJ: Prentice Hall.

Appendix A

Symposium Agenda

PROGRAM FOR SYMPOSIUM

MAKING CONNECTIONS
Four Educational Perspectives

Wednesday, February 22

6:00 - 8:00 p.m. **Check-in and Registration**

Thursday, February 23

8:00 - 9:00 a.m. **Registration and Coffee**

9:00 - 10:00 a.m. **General Session** **Dr. Beth C. Nelson**
Radford University

Welcome *Dr. Frank P. Tota*
Superintendent of Schools
Roanoke City Schools

Introduction of sponsoring groups
Overview of program

Introduction of four speakers

10:15 a.m. - 12:30 p.m. **Introduction to the Methodologies**

Presenters will give 1-hr. presentations with opportunities for questions, interaction.

(Choose 2 with which you are least familiar.)

10:15-11:15

Susan Morris Leflar- 4MAT System
Dr.William Purkey - Invitational Learning
Jay McTighe - Thinking Skills
Dr. Douglas Carnine - Direct Instruction

11:30-12:30
Repeat of above sessions

12:30 p.m. - 1:30 p.m. **LUNCHEON**

2:00 p.m. -3:15 p.m. **First Symposium Session**
Presenters will work in pairs to discuss similarities and differences in their models, and propose how the two can be integrated.

SESSION THEME ***At Risk Students and Special Populations:***
Can an instructional system be devised for a broad spectrum of students using these methodologies?

Direct Instruction and Thinking Skills
D. Carnine, J. McTighe

Learning Styles and Invitational Learning

S. Morris Leflar, W. Purkey

3:15 - 3:45 p.m. **Break - Refreshments**

3:45 p.m. - 5:00 p.m. **Second Symposium Session** **Yvonne V. Thayer**
Radford City Schools

The presenters will discuss questions posed by the following panel of educators:

Dr. Frank P. Tota, Superintendent, Roanoke City Schools
Dr. Thomas Bentson, President-Elect, V A S C D
Mr. Edward Sutphin, Va. Department of Education
Dr. Judy Englehard, Radford University
Dr. Jane Hange, Appalachia Educational Laboratory

5:00 p.m. - 5:45 p.m. Informal Discussions with Presenters

D I N N E R on your own

8:30 p.m. - 9:30 p.m. Informal Discussions with Presenters

Friday, February 24

8:00 - 9:00 a.m. **Continental Breakfast**

9:00 - 10:00 a.m. **Third Symposium Session**
(Choose 1 of 2)

SESSION THEME

Cooperative Learning: *Would cooperative learning enhance any of the four methodologies?*

Thinking Skills and Learning Styles
J. McTighe, S. Morris Leflar

Invitational Learning and Direct Instruction
W. Purkey, D. Carnine

10:15 - 11:15 a.m. **Fourth Symposium Session**
(Choose 1 of 2)

SESSION THEME

Cognitive Instruction: *Now that we perceive the brain as an organ for learning, what do these methodologies have to contribute to cognitive instruction?*

Direct Instruction and Learning Styles
D. Carnine, S. Morris Leflar

Thinking Skills and Invitational Learning
J. McTighe, W. Purkey

11:30 a.m. - 12:45 p.m. **Concluding General Session** **Dr. Nelson**

SESSION THEME

Curriculum Reform: *Does the instructional methodology influence the curriculum reform underway, or are we choosing instructional methodologies which respond to the curriculum we teach?*

Panel of four presenters to make brief concluding remarks and field questions.

RADFORD UNIVERSITY
Center for Cognitive Teaching

Presents

A Symposium
for Educational Leaders

MAKING CONNECTIONS
Four Education Perspectives

February 23 - 24

COSPONSORED BY

V A S C D Virginia Association for Supervision and Curriculum Development

APPALACHIA EDUCATIONAL LABORATORY

ROANOKE COUNTY SCHOOLS
VOCATIONAL AND ADULT EDUCATION DEPARTMENT

Appendix B

Biographical Information on Presenters

Presenter Biographies

Dr. Douglas W. Carnine, Ph.D.
College of Education
University of Oregon
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503/485-3781 (home)

Dr. Douglas W. Carnine is currently a professor in the College of Education at the University of Oregon and is associated with the Engleman-Becker Corporation in Eugene, Oregon. He has been very active in the research community for more than a decade and is noted for his work in the area of direct instruction.

Carnine is engaged in a number of projects at the present time. These include Improving Technology Software—General Science Instructional Systems in Secondary Education, Research on Integrating Technology at the Secondary Level, Research on Videodisc Instruction, Research on Computer Tracked Instruction in Special Education Settings, and the Direct Instruction Follow Through Project. Prior studies/projects include Research on Computer-Assisted Instruction in Higher Order Thinking Skills, Leadership Training in Special Education and Technology, Managing and Evaluating Educational Innovations, and Improving Secondary Schooling.

Carnine has been on the editorial board or a consulting editor of a number of educational publications: *Reading Research Quarterly*, *Exceptional Education Quarterly* (issue editor 1981), *Reading Teacher*, *Society of Learning Disabilities and Remedial Education's Monograph Series*, *Exceptional Children*, *Remedial and Special Education*, *Journal of Special Education Technology*, and *Journal of Learning Disabilities*. In addition, he has had more than 50 research articles (some are currently in press) and 18 issue articles published since 1975. He has co-authored five college texts, three basal texts, and four remedial texts. He also has 19 monographs or chapters in books to his credit. Carnine presently is active in the development of videodisc programs for mastering mathematic concepts.

Ms. Susan Morris Leflar
EXCEL, Inc.
200 West Station Street
Barrington, Illinois 60010
312/382-7272

Ms. Susan Morris Leflar is director of training with EXCEL, Inc. In addition to presenting 4MAT awareness, intermediate, and advanced seminars, Leflar facilitates groups seeking to implement 4MAT and develops 4MAT training materials. Current work also includes researching further training applications of learning styles and brain dominance research.

For nine years, Leflar was director of the Study Skills Center at the University of the Ozarks, a model learning assistance center used by faculty and students. She also has four years of classroom experience as a special education and reading teacher.

Leflar has presented 4MAT in over 48 states and provinces. She has presented as well at national and state conferences, including National Curriculum Study Institutes (sponsored by the Association for Supervision and Curriculum Development) and the National Association of Developmental Education. She has published several articles in the *Journal of Developmental and Remedial Education*.

Leflar received her undergraduate degree from Mary Washington College of the University of Virginia and earned a masters degree in administration, supervision, and higher education at Appalachian State. She received additional training at the Kellogg Institute, Appalachian State University, focusing on innovations in learning/instructional styles, intervention strategies, program management, and evaluation.

Mr. Jay McTighe
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301/381-4978 (home)

Mr. Jay McTighe is currently an education specialist with the Maryland State Department of Education where he coordinates a statewide Thinking Improvement Program. Prior to this position, he served as Area Director for Gifted and Talented Programs in Prince George's County, Maryland, coordinating K-12 programs in 85 schools. He also served as the director of the Maryland Summer Center for Gifted and Talented at St. Mary's College for nine years. He has classroom teaching experience in regular and gifted education and has taught students in grades three through nine.

McTighe has conducted numerous workshops throughout the country in the areas of thinking skills development, gifted education, and creative problem solving. He also teaches graduate-level courses in these areas. He has published articles in a number of journals and books, including *Educational Leadership* (Association for Supervision and Curriculum Development [ASCD]), *Developing Minds* (ASCD), and *Thinking Skills: Concepts and Techniques* (National Education Association).

McTighe received his undergraduate degree in education from the College of William and Mary, earned a masters degree in gifted education from the University of Maryland, and has completed postgraduate studies at the Johns Hopkins University. He was selected to participate in the Education Policy Fellowship Program through the Institute for Educational Leadership in Washington, DC, and the Leadership Training Program at the Creative Problem Solving Institute in Buffalo, New York. He currently serves as director of the Maryland Thinking Collaborative, a statewide network to promote the teaching of thinking, and is a member of the Board of the Mid-Atlantic Association for Cooperation in Education. He recently coordinated a national invitational conference on the assessment of thinking.

Dr. William Watson Purkey, Ed.D.
School of Education
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Dr. William W. Purkey is a professor of Counselor Education in the School of Education at the University of North Carolina at Greensboro and co-director of the International Alliance for Invitational Education. He is a native Virginian and received his doctorate in Psychological Foundations of Education from the University of Virginia.

His professional experience includes teaching as a public school teacher, as an instructor in the United States Air Force, and as a university professor.

Purkey has been awarded the University of Florida Student Award for Instructor Excellence, the Good Teaching Award by the Standard Oil Foundation, and the Outstanding Teacher Award by Omicron Delta Kappa, National Leadership Honor Society. He is also the recipient of the 1979 Ralph F. Berdie Memorial Research Award presented by the American Association of Counseling and Development; the 1980 Distinguished Alumnus Award, given by the School of Education of the University of Virginia; the 1981 Distinguished Service to the Field of Education Award, presented by the Alumni Council, School of Education, Lehigh University; and the 1986 John McGovern Award, presented by the American School Health Association.

An active writer, lecturer, and researcher, Purkey has written over 80 professional articles and five books, including *Self-Concept and School Achievement*, now in its 18th printing, and *Inviting School Success*, co-authored with John Novak of Brock University, now in its second edition.

Purkey's interest is in inviting people to realize their potential. His latest book, co-authored with Jack Schmidt, is entitled *The Inviting Relationship*, published by Prentice-Hall in 1987.